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inRAx®

ILX34-AENWG

Point I/O Platform

Wireless POINT I/O Adapter

September 19, 2011

USER MANUAL

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ILX34-AENWG User Manual

September 19, 2011

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ProSoft Technology® Product Documentation

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Important Safety Information

The following Information and warnings pertaining to the radio module must be heeded.

WARNING – EXPLOSION HAZARD – DO NOT REPLACE ANTENNAS UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

"THIS DEVICE CONTAINS A TRANSMITTER MODULE, FCC ID: . PLEASE SEE FCC ID LABEL ON BACK OF DEVICE."

"THIS DEVICE USES AN INTERNAL COMPACT FLASH RADIO MODULE AS THE PRIMARY RADIO COMPONENT. THE COMPACT FLASH RADIO MODULE DOES NOT HAVE AN FCC ID LABEL. THE COMPACT FLASH RADIO MODULE HAS NO USER SERVICEABLE PARTS."

"THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION."

"CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER's AUTHORITY TO OPERATE THE EQUIPMENT."

Industry Canada Requirements

"THIS DEVICE HAS BEEN DESIGNED TO OPERATE WITH AN ANTENNA HAVING A MAXIMUM GAIN OF 24 dB. AN ANTENNA HAVING A HIGHER GAIN IS STRICTLY PROHIBITED PER REGULATIONS OF INDUSTRY CANADA. THE REQUIRED ANTENNA IMPEDANCE IS 50 OHMS."

"TO REDUCE POTENTIAL RADIO INTERFERENCE TO OTHER USERS, THE ANTENNA TYPE AND ITS GAIN SHOULD BE CHOSEN SUCH THAT THE EQUIVALENT ISOTROPICALLY RADIATED POWER (EIRP) IS NOT MORE THAN THAT REQUIRED FOR SUCCESSFUL COMMUNICATION."

"THE INSTALLER OF THIS RADIO EQUIPMENT MUST INSURE THAT THE ANTENNA IS LOCATED OR POINTED SUCH THAT IT DOES NOT EMIT RF FIELD IN EXCESS OF HEALTH CANADA LIMITS FOR THE GENERAL POPULATION; CONSULT SAFETY CODE 6, OBTAINABLE FROM HEALTH CANADA."

Important User Information

Important: Power must be provided from a limited power source.

Because of the variety of uses for the products described in this publication, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards. In no event will ProSoft Technology be responsible or liable for indirect or consequential damage resulting from the use or application of these products.

Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, ProSoft Technology does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Rockwell Automation office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Throughout this publication, notes may be used to make you aware of safety considerations. The following annotations and their accompanying statements help you to identify a potential hazard, avoid a potential hazard, and recognize the consequences of a potential hazard:

Warning: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

Caution: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

Important: Identifies information that is critical for successful application and understanding of the product.

Burn Hazard: Labels may be located on or inside the equipment (for example, drive or motor) to alert people that surfaces may be dangerous temperatures.

Shock Hazard: Labels may be located on or inside the equipment (for example, drive or motor) to alert people that dangerous voltage may be present.

Environment and Enclosure

Caution: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as "open type" equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment.

Caution: Preventing Electrostatic Discharge

- This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:
- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.
- When not in use, store the equipment in appropriate static-safe packaging.

Caution: POINT I/O is grounded through the DIN-rail to chassis ground. Use zinc-plated, yellow-chromated steel DIN-rail to assure proper grounding. Using other DIN-rail materials (for example, aluminum, plastic, and so on) which can corrode, oxidize or are poor conductors, can result in improper or intermittent platform grounding.

Caution: When you connect or disconnect the Removable Terminal Block (RTB) with field side power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

Important Installation Instructions

The following Information and warnings pertaining to the radio module must be heeded:

A "THIS DEVICE CONTAINS A TRANSMITTER MODULE, FCC ID: R68MTCHDRCT. PLEASE SEE FCC ID LABEL ON BACK OF DEVICE."

B "THIS DEVICE USES AN INTERNAL COMPACT FLASH RADIO MODULE AS THE PRIMARY RADIO COMPONENT. THE COMPACT FLASH RADIO MODULE DOES NOT HAVE AN FCC ID LABEL. THE COMPACT FLASH RADIO MODULE HAS NO USER SERVICABLE PARTS."

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C "THE INSTALLER OF THIS RADIO EQUIPMENT MUST INSURE THAT THE ANTENNA IS LOCATED OR POINTED SUCH THAT IT DOES NOT EMIT RF FIELD IN EXCESS OF HEALTH CANADA LIMITS FOR THE GENERAL POPULATION; CONSULT SAFETY CODE 6, OBTAINABLE FROM HEALTH CANADA."

European Hazardous Location Approval

European Zone 2 Certification (The following applies when the product bears the EEx Marking)

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC.

The ATEX test report certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to this Directive. The examination and test results are recorded in a confidential report.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-0 and EN60079-15.

Important: Observe the following additional Div 2 certification requirements.

- This equipment is not resistant to sunlight or other sources of UV radiation.
- The secondary of a current transformer shall not be open-circuited when applied in Class I, Div 2 environments.
- Equipment of lesser Enclosure Type Rating must be installed in an enclosure providing at least IP54 protection when applied in Class I, Div 2 environments.
- This equipment shall be used within its specified ratings defined by Allen-Bradley.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40% when applied in Class I, Div 2 environments.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:

Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.

Warning: EXPLOSION HAZARD -

Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.

Substitution of components may impair suitability for Class I, Division 2.

If this product contains batteries, they must only be changed in an area known to be nonhazardous.

Informations sur l'utilisation de cet équipement en environnements dangereux:

Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

Avertissement: RISQUE D'EXPLOSION –

Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.

Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit.

La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe 1, Division 2.

S'assurer que l'environnement est classé non dangereux avant de changer les piles.

Agency Approvals & Certifications

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Wireless Approvals

Visit our website at www.prosoft-technology.com for current wireless approval information.

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To get the most benefit from this User Manual, you should have the following skills:

- **Rockwell Automation® RSLogix™ software**: launch the program, configure ladder logic, and transfer the ladder logic to the processor
- **Microsoft Windows:** install and launch programs, execute menu commands, navigate dialog boxes, and enter data.
- **Hardware installation and wiring**: install the adapter, and safely connect AENWG and POINT I/O devices to a power source and to the ILX34-AENWG adapter's application ports.
-

Caution: You must be able to complete the application without exposing personnel or equipment to unsafe or inappropriate working conditions.
Important: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

1.1 Overview

The ILX34 Wireless Point I/O is a wireless input/output interface that can provide wireless data transfer functionality between automation systems based on a diverse range of controllers and processors. Supported systems include:

- Rockwell Automation® (RA) ControlLogix® Programmable Automation Controller (PAC) systems
- RA CompactLogix™ (CPLX) PAC systems

The Wireless POINT I/O benefits users who require a non-tethered link to distributed I/O in applications with moving, remote, or difficult / costly to wire devices or control panels. Customers may also choose to use wireless I/O to save time and money versus installation of wire.

1.2 Package Contents

The following components are included with your ILX34-AENWG adapter, and are all required for installation and configuration.

Important: Before beginning the installation, please verify that all of the following items are present.

Qty.	Part Name	Part Number	Part Description
1	ILX34-AENWG Adapter	ILX34-AENWG	Wireless POINT I/O Adapter
1	Antenna	A2405S-OA	2.4 GHz Articulating Omni Antenna
1	ILX34-AENWG CD		Contains utilities and documentation for the ILX34-AENWG adapter.

If any of these components are missing, please contact ProSoft Technology Support for replacement parts.

1.3 System Requirements

The ILX34-AENWG adapter requires the following minimum hardware and software components:

- Rockwell Automation® processor, with compatible power supply
  - ControlLogix® 1756-L6x (firmware version 17.03 or higher), or 1756-6xS (firmware version 17.07 or higher)
    or
  - CompactLogix™ 1769-L32E or 1769-L35E, (firmware version 17.04 or higher)
- Rockwell Automation RSLogix 5000 programming software version 16 or higher (page 195). Version 17 is required if you wish to use the ILX34-AENWG Add-On Profile.
- Rockwell Automation RSLinx communication software version 2.54 or higher
- An 802.11g Radio. ProSoft recommends the RLXIB-IHW 802.11 a/b/g Industrial Hotspot (page 19).
- If you plan to use the ILX34-AENWG with a 1756-ENBT module or 1768-ENBT module, note the following firmware version requirements:
  - 1756-ENBT firmware revision 4.007 or later
  - 1768-ENBT firmware revision 2.003 or later
  - Use BootP revision 2.3.2 or later to assign IP addresses to the adapter.
- Pentium® II 450 MHz minimum. Pentium III 733 MHz (or better) recommended
- Supported operating systems:
  - Microsoft Windows Vista
  - Microsoft Windows XP Professional with Service Pack 1 or 2
  - Microsoft Windows 2000 Professional with Service Pack 1, 2, or 3
  - Microsoft Windows Server 2003
- 128 Mbytes of RAM minimum, 256 Mbytes of RAM recommended
- Microsoft Windows Explorer version 7
- 256-color VGA graphics adapter, 800 x 600 minimum resolution (True Color 1024 × 768 recommended)
- CD-ROM drive

Note: The Hardware and Operating System requirements in this list are the minimum recommended to install and run software provided by ProSoft Technology. Other third party applications may have different minimum requirements. Refer to the documentation for any third party applications for system requirements.

1.4 Install the Configuration Tools

1.4.1 Install the ILX34-AENWG Add-On Profile

1 Verify that your computer meets the hardware and operating system requirements. (page 15)

Important: You must have "Administrator" rights on your computer to install this application.

2 Insert the ProSoft Solutions CD-ROM in an available CD-ROM drive in your computer.
3 On most computers, the installation program will start automatically within a few seconds. If the installation does not start automatically on your computer, click the **START** button, choose **RUN,** and then type `explorer`. Click **OK** to start Windows Explorer. In Windows Explorer, open the **MY COMPUTER** icon and navigate to the CD-ROM drive.
4 Navigate to the folder containing the ILX34-AENWG Add-On Profile, and then double-click the file **SETUP.EXE**. This action starts the installation wizard.
5 Follow the instructions on the installation wizard to install the program.
6 Click **FINISH** to complete the installation. If you are prompted to restart your computer, save your work in any applications that are running, close the applications, and allow the computer to restart.

1.4.2 Install ProSoft Wireless Designer

1 On the CD-ROM, navigate to the folder containing ProSoft Wireless Designer, and then double-click the file **SETUP.EXE**. This action starts the installation wizard.
2 Follow the instructions on the installation wizard to install the program.
3 Click **FINISH** to complete the installation. If you are prompted to restart your computer, save your work in any applications that are running, close the applications, and allow the computer to restart.

1.5 Planning the Network

Before you configure and install the network, you should create a plan for it. The following points assume that you are creating a bridge network of masters and repeaters, but you can also set up clients to work with devices on existing wireless LANs. For information, see Set up a Client.

The simplest way to design the physical network of radios, antennas, connectors, cables, amplifiers and other accessories, is to use ProSoft Wireless Designer (page 18). This application determines your hardware needs based on your answers to a few questions, and then generates a Bill of Materials specifying all the components you will need for your installation.

- To begin, determine where you need radios and then choose locations for them accordingly. For example, you might decide to install your master radio near a PC in a central plant location (You can use the PC to configure the radios through the Radio Configuration / Diagnostic Utility). If the plant is an oil refinery, for example, you might decide to install radios near the oil tanks.
- The next important issue is how to link the radios. Unless the radios are very close together, you must make sure that each pair of radio antennas in the network has a line of sight between them. In other words, you must be able to see from one antenna to another, either with the naked eye, or with binoculars.
- If a line of sight does not exist between antennas, you must choose a site for installing a repeater radio, which will create a bridge between the radio antennas.
- Choose the appropriate antennas for the network. If an antenna will be connected to the radio by a long cable, you might need to purchase a power amplifier, which is available from ProSoft Technology. The more distance between an antenna and its radio, the more signal loss the radio will have.
- Consider drawing up your network plans on paper. As part of the drawing, you should assign a logical name to each radio. You can use these names later when configuring the radios in the Radio Configuration / Diagnostic Utility.
- As part of your planning, you might want to conduct a site survey. ProSoft Technology can perform this survey, you can do it yourself, or you can hire a surveyor.
- Protect radios from direct exposure to weather, and provide an adequate, stable power source. Make sure that your plan complies with the radio's power requirements and cable specifications.

Important: Radios and antennas must be located at least 8 inches (20 cm) away from personnel.

1.5.1 Installation Questions

Answer the following questions to make your installation easier, and to familiarize yourself with your system and what you want to do.

How many radios in your network?
Master ID
Repeater ID
ILX34-AENWG ID
Locations
Is there a Line of Sight between them?
Selected the appropriate antennas for your network?

1.5.2 ProSoft Wireless Designer

ProSoft Wireless Designer simplifies the task of specifying a ProSoft Wireless installation, and provides a variety of views containing an accurate description of each site in a wireless network, including:

- Visual diagram of site layout
- Location (latitude/longitude, based on GPS coordinates)
- Radio type, frequency range, and country-specific channel and power requirements
- Length, type and estimated signal loss for cables
- Required accessories, including lightning protection, cable adaptors and antennas
- Complete parts list

Use *ProSoft Wireless Designer* when conducting a site audit for a customer, and then provide the customer with a complete list of components and a detailed description for each site and link. Customers can use this information to understand and visualize their network, and provide necessary information for technical support and maintenance.

Functional Specifications:

- Contains a database of all currently available RadioLinx radios, antennas, cables, connectors and accessories
- Exports Parts List, Site and Link Details, and Wizard settings into a variety of common file formats, for import into applications such as spreadsheets, databases and word processors
- Checks wireless link feasibility based on path length and recommended accessories
- Predicts signal strength based on distance, local regulations and hardware choices
- Fully documents your ProSoft Wireless network plan

1.5.3 WirelessN Discovery Tool Functional Specifications

The ProSoft WirelessN Discovery Tool supports the following network discovery and monitoring activities:

- Discover and view the list of radios in the network
- Display graphically the current network topology and display parent-child links between various radios in the network
- Scan the network on demand
- Save and load network snapshots
- Upload and download configuration files to/from radio devices
- Upgrade Radio firmware

1.6 Planning the Physical Installation

A network's performance is affected by attributes specific to the installation site. Consider the following cautions, where possible, to optimize your network installation:

- Design the network to use less than 2048 radios (per network)
- Place radios within the specified 15 miles of each other
- Add repeater to extend distance or where line of sight is limited
- Radios or antennas CANNOT be placed within 8 inches (20 cm) of where people will be

Though radio frequency communication is reliable, sometimes its performance can be affected by intangibles. A good network installation plan includes **time** and **resources** for performance testing and installation changes.

Test the installation plan (page 51) before the network installation is complete.

1.7 Configure the Wireless Access Point

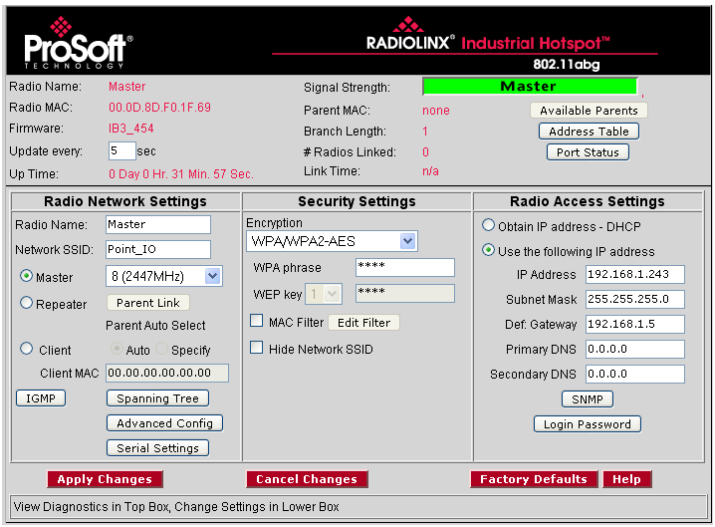
Although the ILX34-AENWG can communicate with any 802.11b/g Access Point radio, ProSoft Technology recommends the RadioLinx series Industrial Broadband radios wherever performance and compatibility are required.

The following configuration steps are for the RLXIB-IHW. Use the examples in these steps to configure your own Access Point to work with the ILX34-AENWG.

1.7.1 Configure the Master Radio (Required)

The following illustration shows an example configuration for a RadioLinx Industrial Hotspot (Access Point) configured as a Master radio.

Note: The radio in this illustration is capable of transmitting at 5 GHz (802.11a) as well as 2.4 GHz (802.11b/g). The radio in the ILX34-AENWG adapter supports only 2.4 GHz (802.11b/g).



In particular, note the following settings.

- **Network SSID:** All radios on the network must use the same Network SSID In this example, the Network SSID is "Point_IO".
- **Channel:** All radios must use the same channel. In this example, the channel is 8 (2447MHz).
- **Encryption**: All radios must use the same encryption settings. In this example, the encryption type is WPA/WPA2-AES.
- **Passphrase**: All radios must use the same passphrase. For security reasons, the passphrase field is replaced with asterisks. Make a note of the passphrase before configuring additional radios.

Important: Take care to enter the passphrase on the ILX34-AENWG exactly as you entered it in the Master radio.

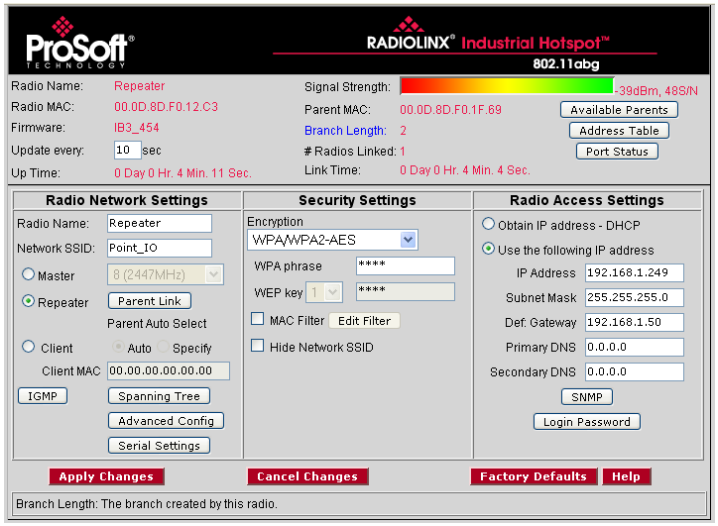
- **IP Address:** The IP address for all radios must be within the same subnet, and each radio requires its own unique IP address. You can assign static IP addresses, as in this example, or you can use DHCP (Dynamic Host Control Protocol) to manage and assign IP addresses automatically (page 25).

Note: Refer to the documentation for your radio (for example, the *RLXIB-IHW User Manual*) for specific steps to configure the settings in this example.

1.7.2 Configure One or More Repeaters (Optional)

The following illustration shows an example configuration for a RadioLinx Industrial Hotspot (Access Point) configured as a Repeater radio. The need for repeater radios is determined by the distance between the Master radio and the ILX34-AENWG, as well as any topographical factors such as hills or other obstructions, which could prevent a clear line-of-sight signal path.

Note: The radio in this illustration is capable of transmitting at 5 GHz (802.11a) as well as 2.4 GHz (802.11b/g). The radio in the ILX34-AENWG adapter supports only 2.4 GHz (802.11b/g).



In particular, note the following settings.

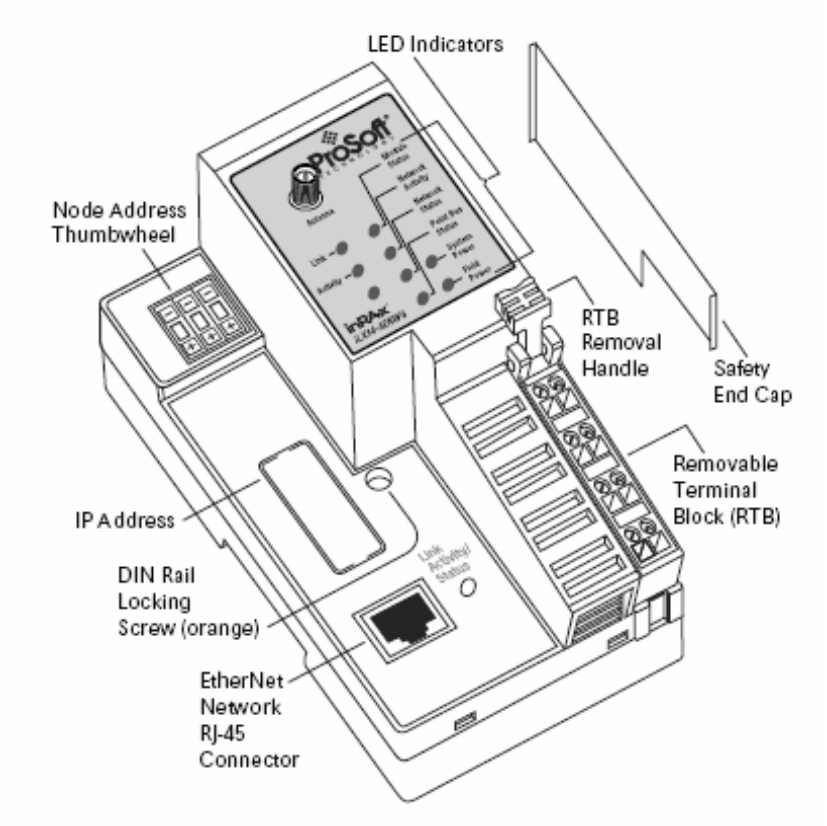
- **Network SSID, Channel, Encryption** and **Passphrase** for the Repeater radio must match those configured for the Master radio and the ILX34-AENWG.
- **IP Address:** The IP address for all radios must be within the same subnet, and each radio requires its own unique IP address. You can assign static IP addresses, as in this example, or you can use DHCP (Dynamic Host Control Protocol) to manage and assign IP addresses automatically (page 25).

Note: Refer to the documentation for your radio (for example, the *RLXIB-IHW User Manual*) for specific steps to configure the settings in this example.

1.8 Install the Adapter

Attention: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

1.8.1 Adapter Components

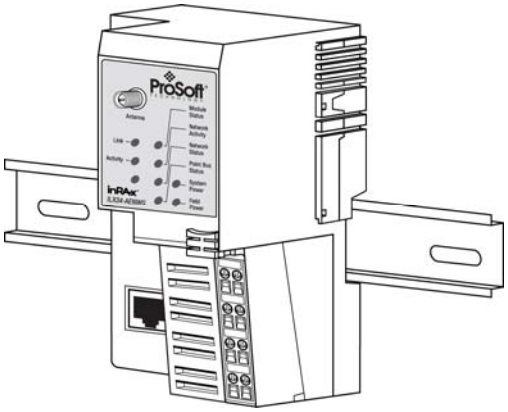


The Wireless POINT I/O Adapter is a communications adapter for POINT I/O modules. The adapter provides an interface for controlling and communicating with POINT I/O modules from an Ethernet network.

1.8.2 Install the Wireless Point I/O Adapter on the DIN-rail

Warning: You must follow all safety instructions when installing this or any other electronic devices. Failure to follow safety procedures could result in damage to hardware or data, or even serious injury or death to personnel. Refer to the documentation for each device you plan to connect to verify that suitable safety procedures are in place before installing or servicing the device.

1. Position the adapter vertically above the DIN-rail.
2. Press down firmly to install the adapter on the DIN-rail, and then turn the orange screw to lock the adaptor onto the DIN-rail.



Warning: If you connect or disconnect the Ethernet cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding.

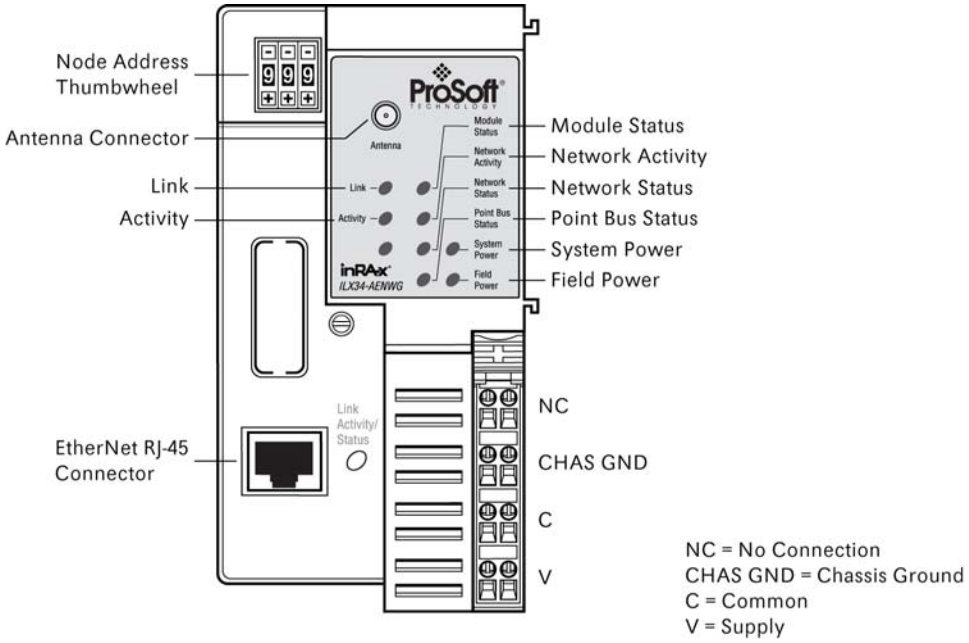
3. Slide the safety end cap up to remove. This exposes the backplane and power interconnections.

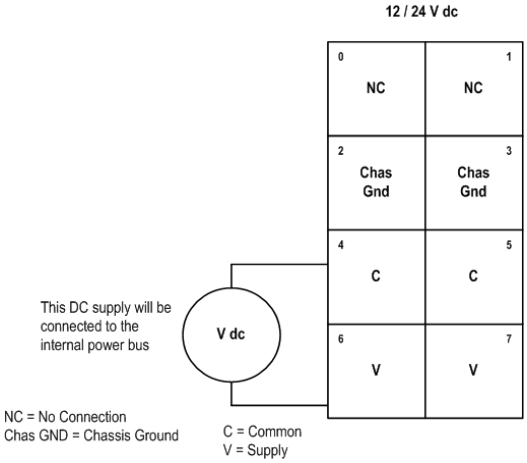
Caution: Do not discard the end cap. Use this end cap to cover the exposed interconnections on the last mounting base on the DIN-rail. Failure to do so could result in equipment damage or injury from electric shock.
Important: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

1.8.3 Connect Power to the Adapter

The ILX34-AENWG adapter requires an external source of DC voltage. The DC source voltage should be 24V nominal, with a range of 10V to 28.8V. Refer to the following illustrations for wiring information.

Caution: Do not connect 120/240V ac power to this supply.
Warning: If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding.





When you power up the POINT I/O for the first time, the adapter must assign addresses to every module in the backplane. POINT I/O modules are all initially configured at the same address.

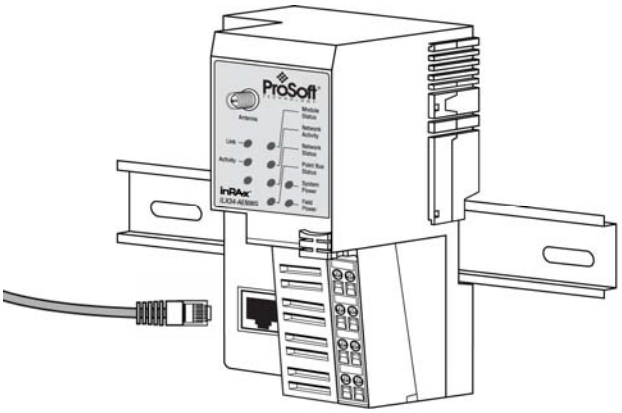
When you first apply power, all but one module on the backplane should show a solid red Module Status LED.

One by one, the adapter resets these modules and assigns addresses. The amount of time that this operation takes depends on the size of your POINT I/O system.

1.8.4 Connect the Adapter to the EtherNet/IP Network

Connect an Ethernet cable between the adapter's Ethernet port, and the EtherNet/IP network.

Note: This connection is temporary, and is helpful during configuration. You will disconnect the Ethernet cable after you have finished configuring the adapter for wireless communication.



1.8.5 Configure the Adapter for Your EtherNet/IP Network

Before using your adapter in an EtherNet/IP network, configure it with an IP address, subnet mask, and optional Gateway address. This chapter describes these configuration requirements and the procedures for providing them. Here are ways you can do this:

- Use the Rockwell BootP utility, version 2.3 or later, which ships with RSLogix 5000 or RSLinx software. (page 29)

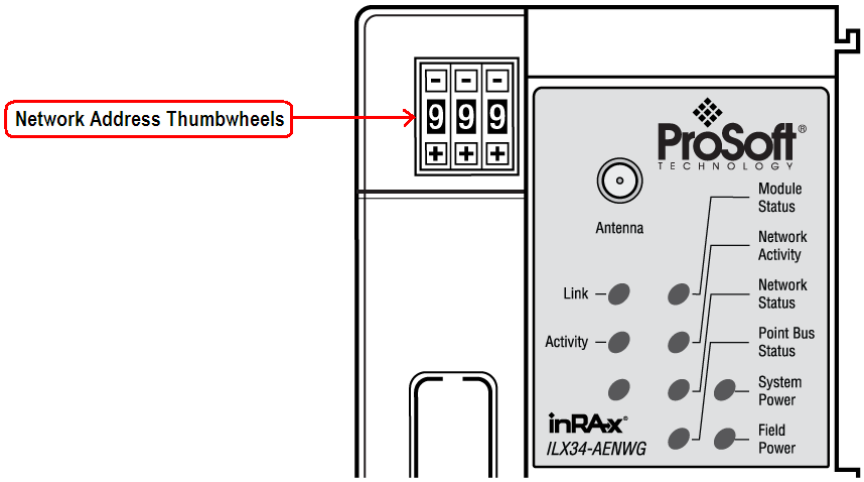
  You can also use this utility to reconfigure a device with an IP address you must change.
- Use a third party DHCP server. (page 27)
- Use the Network Address thumbwheel switch. (page 25)

Important: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

Configure the IP Address with the Thumbwheel Switches

ore you can connect to the ILX34-AENWG for the first time, you must configure its IP address.

The simplest way to set the IP address for your initial connection is to use the thumbwheel switches on the front of the adapter.



The three thumbwheel switches represent the final octet for the private IP address 192.168.1.xxx (where xxx represents the number set on the switches).

The factory default switch setting is 999. Use the buttons above and below each number to select a temporary IP address to use. Choose a number between 001 and 254, taking care not to duplicate the IP address of any other device on the network.

NOTE: Settings 777 and 888 are reserved and used for special functions. For details, see Restoring All Factory Default Settings (page 116).

If you set the switches to an invalid number (that is, 000 or a value greater than 254), the adapter checks to see if you enabled DHCP, according to the following table.

If DHCP is	Then the adapter
Enabled	Asks for an address from a DHCP server. The DHCP server also assigns other Transport Control Protocol (TCP) parameters.
Not enabled	Uses the IP address (along with other TCP configurable parameters) stored in nonvolatile memory

The updated IP address setting will take effect when the adapter is powered up.

Using DHCP Software to Configure Your Adapter

DHCP (Dynamic Host Configuration Protocol) software automatically assigns IP addresses to client stations logging onto a TCP/IP network.

DHCP is based on BootP and maintains some backward compatibility. The main difference is that BootP was designed for manual configuration, while DHCP allows for dynamic allocation of network addresses and configurations to newly attached devices.

Be cautious about using DHCP software to configure your adapter. A DHCP server typically assigns a finite lease time to the offered IP address.

When 50% of the leased time has expired, the ILX34-AENWG adapter attempts to renew its IP address with the DHCP server.

The possibility exists that the adapter will be assigned a different IP address, which would cause the adapter to cease communicating with the ControlLogix controller.

Refer to Configure the ILX34-AENWG Adapter with Fixed IP Address (page 28).

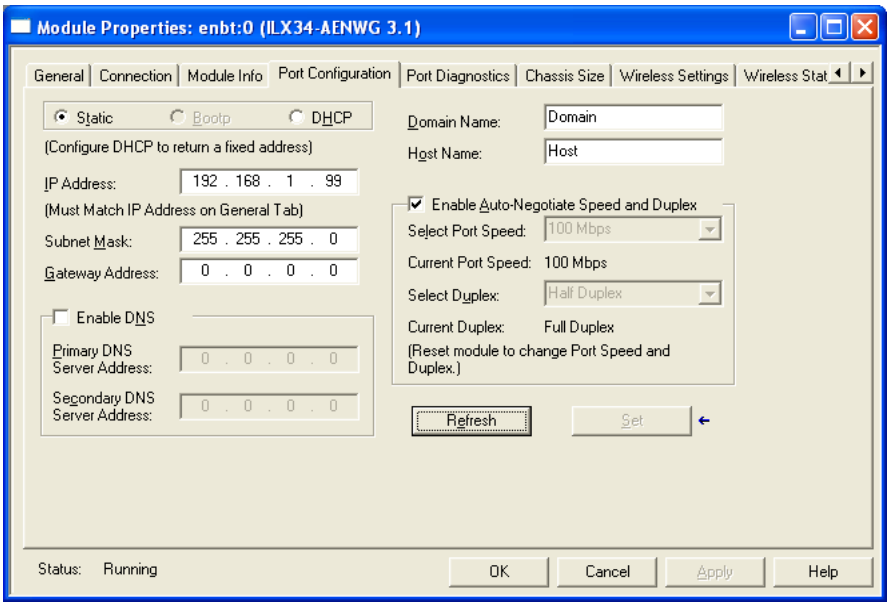
Caution: To avoid unintended control, the ILX34-AENWG adapter must be assigned a fixed IP address. The IP address of this adapter should not be dynamically provided. If a DHCP server is used, it must be configured to assign a fixed IP address for your adapter.
Failure to observe this precaution may result in unintended machine motion or loss of process control.

Configuring the Adapter with Fixed IP Address

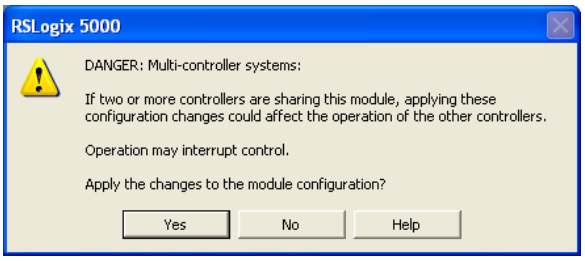
A fixed IP address prevents the adapter from losing a dynamically assigned IP address and ceasing to communicate with the controller:

To configure the ILX34-AENWG adapter with a fixed IP address

1. Click the **PORT CONFIGURATION** tab in the ILX34-AENWG adapter properties dialog.
2. Unselect (uncheck) the **ENABLE DHCP** check box.



3. Click the **SET** button.


RSLogix 5000
DANGER: Multi-controller systems:
If two or more controllers are sharing this module, applying these configuration changes could affect the operation of the other controllers.
Operation may interrupt control.
Apply the changes to the module configuration?
Yes
No
Help

4. Click **OK** to dismiss the confirmation dialog box.
5. Click the **REFRESH** button to verify the changes.

Using the Rockwell BootP/DHCP Utility

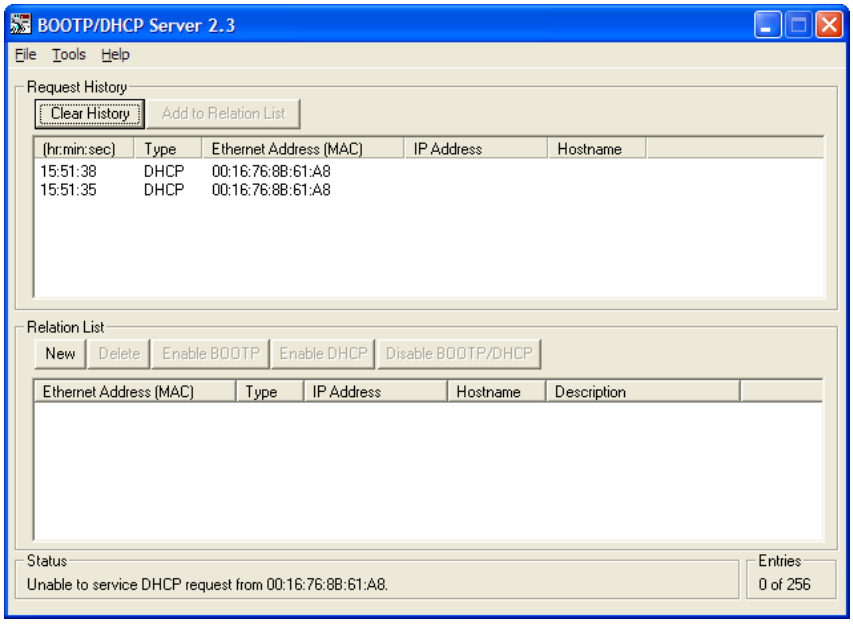
The Rockwell **BOOTP/DHCP** utility is a stand-alone program that incorporates the functionality of standard BootP software with a user-friendly graphical interface. You can install BootP from the **UTILS** directory on the RSLogix5000 installation CD.

To use BootP, you must enable DHCP on ILX34-AENWG adapter, and the adapter's network address switches must be set to a value greater than 255 (page 25).

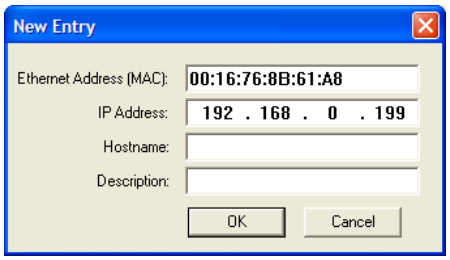
To configure your adapter using the BootP utility, perform the following steps:

1 Run the BootP software.

In the **BOOTP REQUEST HISTORY** pane, you will see the hardware addresses of devices on the network that are issuing BootP requests.

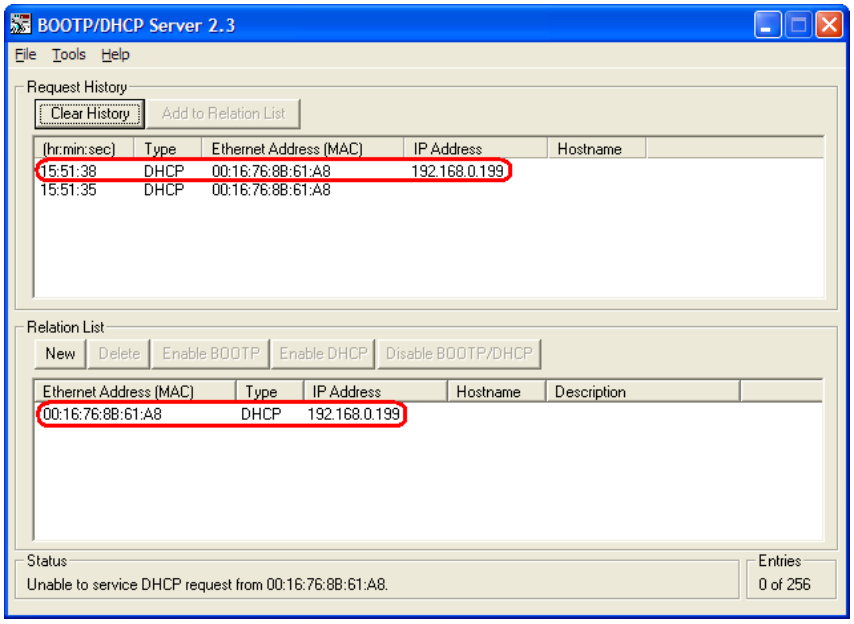


2 Double-click the hardware address of the device to configure. This action opens the **NEW ENTRY** dialog bow, populated with the device's Ethernet Address (MAC).



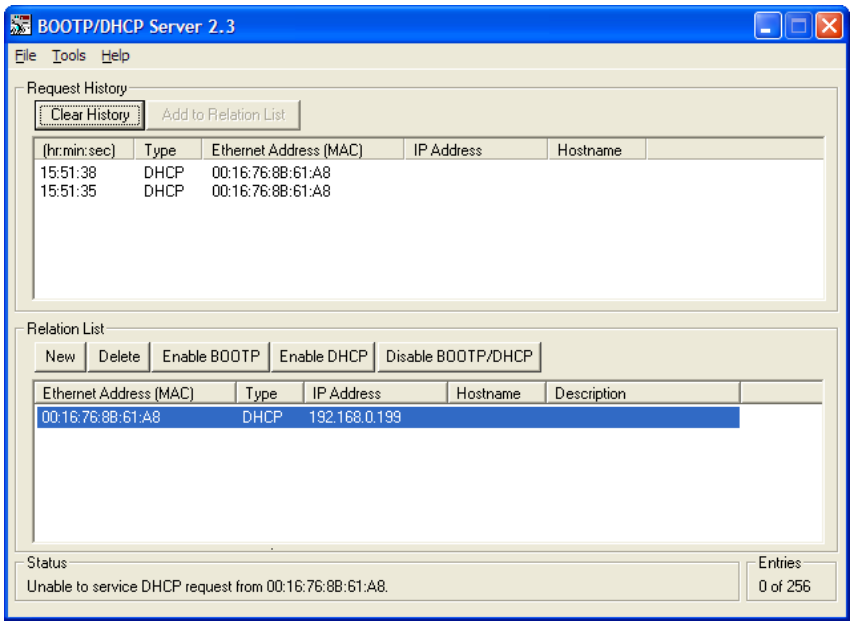
3 Enter the IP Address to assign to the device, and click **OK.** You can leave the **HOSTNAME** and **DESCRIPTION** fields blank.

Notice that the IP Address you assigned now appears in the Request History pane. Notice also that the device now appears in the Relation List pane.



To assign this configuration to the device, select the device in the **RELATION LIST** pane, and then click the **DISABLE BOOTP/DHCP** button. The device will use the assigned configuration the next time it is powered up, and will no longer issue DHCP requests.

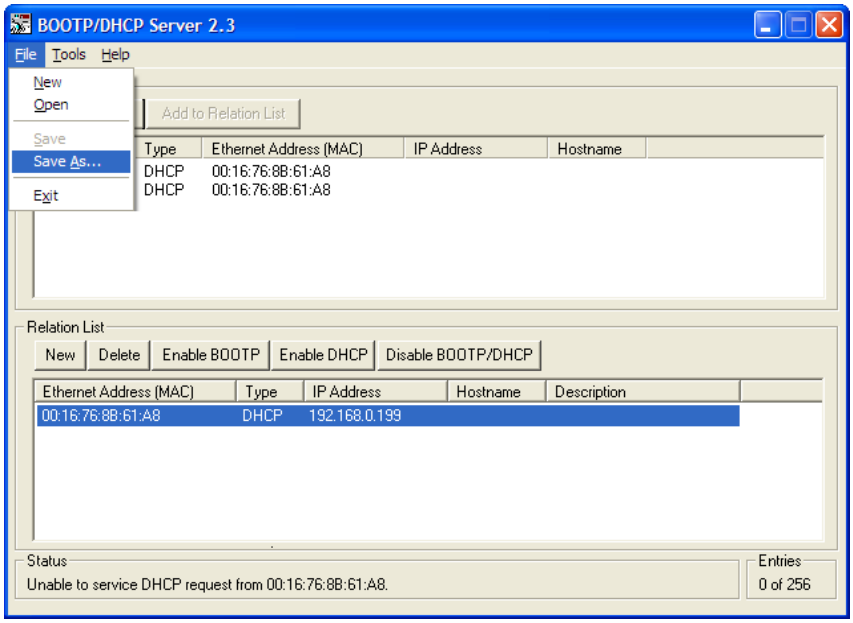
4 To enable DHCP for a device with DHCP disabled, select the device in the **RELATION LIST**, and then click the **ENABLE DHCP** button.



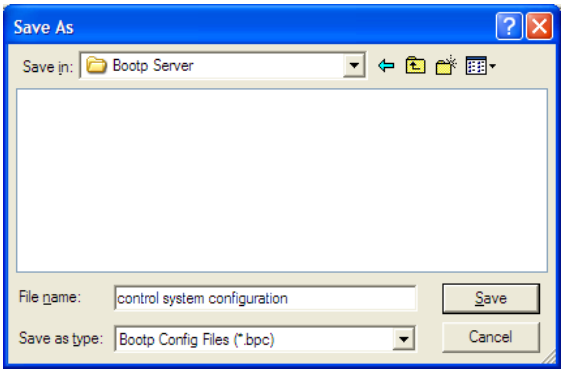
Save the Relation List

You can save the Relation List to use later, for example, to have a record of IP addresses assigned to specific MAC addresses.

1 Open the **FILE** menu, and then choose **SAVE AS**.



This action opens the **SAVE AS** dialog box.



2 Enter a File name for the Relation List (for example, `control system configuration`), and click **SAVE.**

1.8.6 Configure the ILX34-AENWG for Wireless Access

You can configure the ILX34-AENWG's wireless settings from the **MODULE PROPERTIES** dialog box in RSLogix 5000, or from the ILX34-AENWG's web page (page 32). The first time you configure the adaptor, you should use the adapter's web page.

Important: The wireless settings for the ILX34-AENWG must be compatible with the Industrial Hotspot radio (page 19) connected to the Ethernet bridge (for example, a 1756-ENBT module in a ControlLogix rack).
Important: All radios on the network must use the same settings, otherwise they will be unable to communicate with each other.

Connect to the Adapter's Web Page

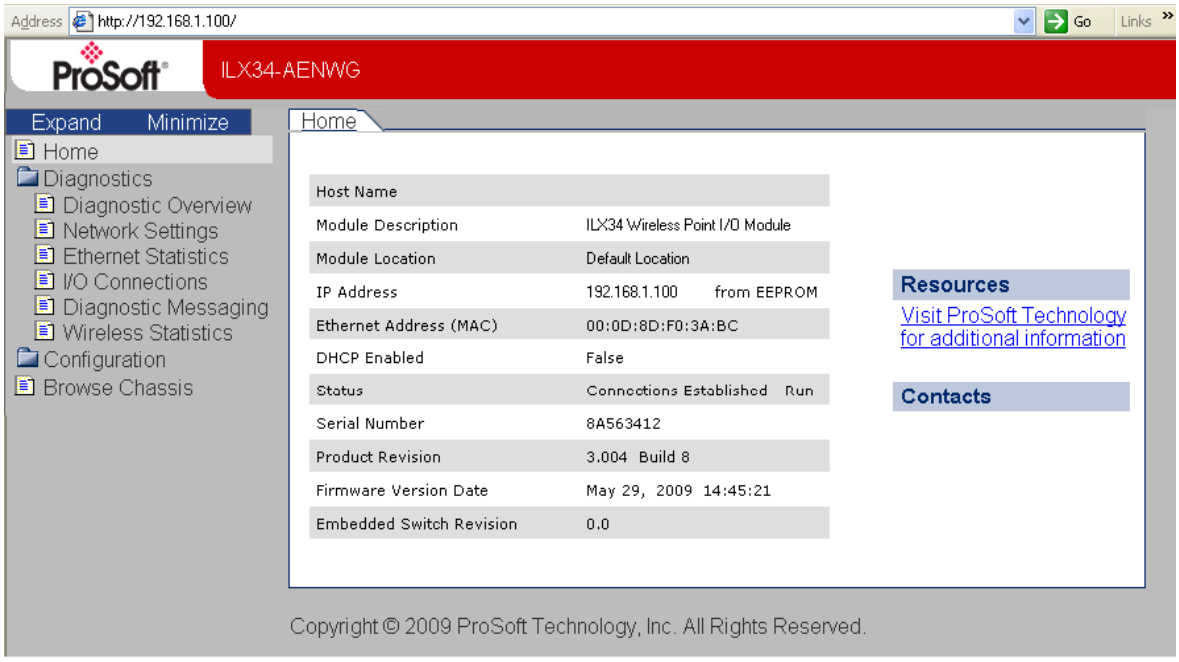
Open your web browser (for example, Microsoft Internet Explorer or Firefox), and connect to the adapter's temporary network address.

http://192.168.1.xxx
(where xxx is the value you entered in the rotary switches on the front of the adapter.)

Important: Your PC must be on the same TCP/IP subnet as the adaptor to view these pages.
Important: You must prefix the numeric IP address with "`http://`", otherwise the web browser may not be able to interpret the address.

The adapter's home page consists of a tree view in the left pane for navigation, and an information pane in the middle. The right column contains links for additional resources and information.

- To view the contents of a folder, click the **EXPAND** button.
- To select a page to view, click the page title in the tree view.

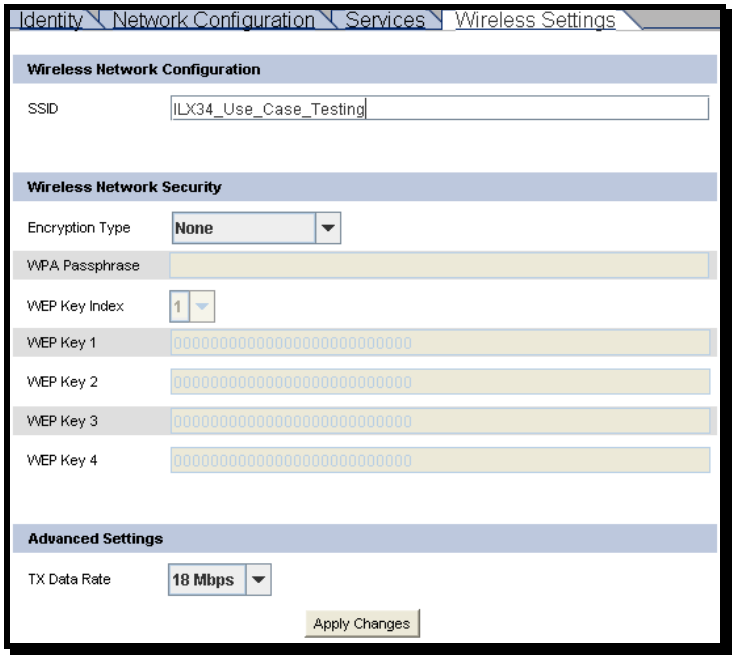


If you are unable to connect to the adapter's web page, verify that your PC is correctly configured to reach IP addresses on the subnet where your adapter communicates.

Wireless Settings Page

The **WIRELESS SETTINGS** page opens when you select the **CONFIGURATION** folder in the menu on the left side of the page, and then click the **WIRELESS SETTINGS** link. Use this page to configure the radio settings for the adapter.

Important: The values on this page are in non-volatile memory. Changes to these parameters do not take effect until you reset or cycle power to the ILX34-AENWG adapter.



Field	Description
SSID	Assign a network name (SSID) of up to 32 characters. The radio uses this name in all network references. All radios in a network must have the same SSID. SSID names are case-sensitive.
Encryption Type	Choose the method by which the adapter will apply encryption security: ▪ NONE (not recommended) ▪ WEP128 - Legacy security setting using a 128-bit key and WEP encryption. ▪ WPA2/AES (Preferred) - Security setting using WPA (pre-shared key) authentication and AES encryption. The preferred encryption type is AES (Advanced Encryption Standard). You should only select WEP (wired equivalency protocol) for use with an older client radio that only has WEP encryption. WEP is the original security protocol used by 802.11 networks, but AES offers better protection against attacks, for several reasons: AES uses an advanced encryption algorithm that is not susceptible to the same weaknesses as WEP, it performs dynamic key management by changing the session keys frequently, and it performs message integrity checks to prevent forgery and replay. You can also select WEP 128, or None (no encryption) as the encryption type, but none of these settings are recommended.

Field	Description
WPA Passphrase	To use WPA2/AES encryption on packets sent between the radios, enter a WPA2/AES pass phrase of between eight and 63 normal keyboard characters. This phrase automatically generates an encryption key of 128 hexadecimal characters. This field is only available if you select WPA2/AES as the encryption type.
WEP Key Index	If using WEP128 encryption, select the Key Index that matches the Key Index used in the Access Point.
WEP Keys (1-4)	If using WEP128 encryption, enter the WEP Keys that match the Keys in the Access Point.
Transmit Data Rate	The recommended The ILX34-AENWG supports the following transmit data rates. The default value is Auto: Max 54 Mbps, and this is the recommended value for most applications.

1 Mbps	Auto: Max. 1 Mbps
2 Mbps	Auto: Max. 2 Mbps
5.5 Mbps	Auto: Max. 5.5 Mbps
11 Mbps	Auto: Max. 11 Mbps
18 Mbps	Auto: Max. 18 Mbps
24 Mbps	Auto: Max. 24 Mbps
36 Mbps	Auto: Max. 36 Mbps
54 Mbps	Auto: Max. 54 Mbps

Verify Wireless Communication

At this point, with the Ethernet cable still attached to the ILX34-AENWG, go to the **WIRELESS STATISTICS** web page, and verify that the ILX34-AENWG is linked to the Access Point.

After the link is established, you should disconnect the Ethernet cable from the ILX34 and reconnect it to the Access Point. From this point on, all communications can be done wirelessly.

Note: If Ethernet cables are connected to both the ILX34-AENWG and the Access Point, and there is a wireless link between these devices, a loop will be formed. Typically the Access Point detects this loop and disconnects the wireless link. In this condition, the link LED on the ILX34-AENWG will periodically come on and then go off. Also, the Wireless Statistics web page will sometimes show the unit is linked and then later show that it is not.

2 Configure the ILX34-AENWG

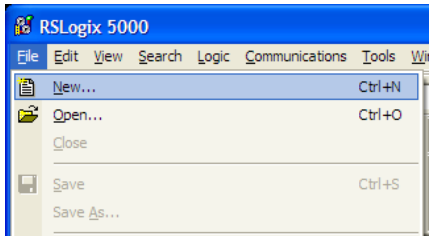
In This Chapter

- Create a New RSLogix 5000 Project 37
- Create the Network 39
- Create the Adapter 41
- Add POINT Modules Under the Adapter 44
- Configure 1734 POINT I/O Modules 45
- Configuring Wireless Settings in RSLogix 5000 49
- Install the Antenna 50
- Test the Network Installation Plan 51

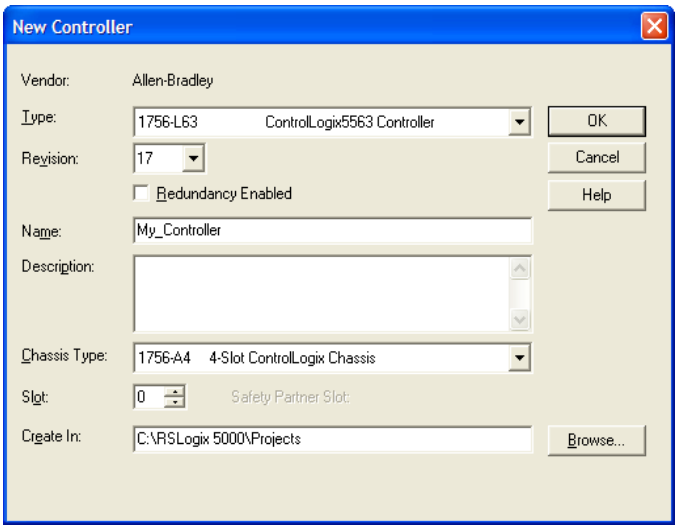
2.1 Create a New RSLogix 5000 Project

Note: The following steps require RSLogix 5000 version 17 or newer, and a processor with firmware compatible with this version of RSLogix 5000. To use the ILX34-AENWG adapter with an earlier version of RSLogix 5000 or the processor firmware, please refer to Using the ILX34-AENWG with Earlier Versions of RSLogix 5000 (page 195).

1 Open the **FILE** menu, and then choose **NEW...**

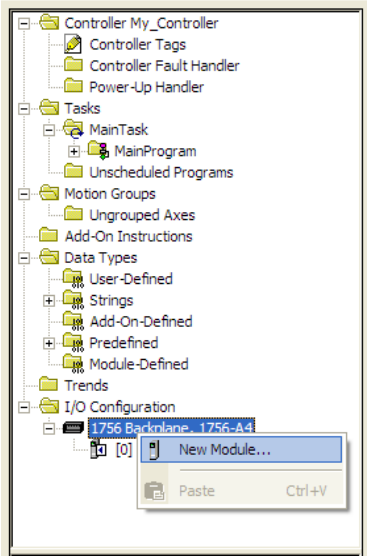


2 Select **REVISION 17**.

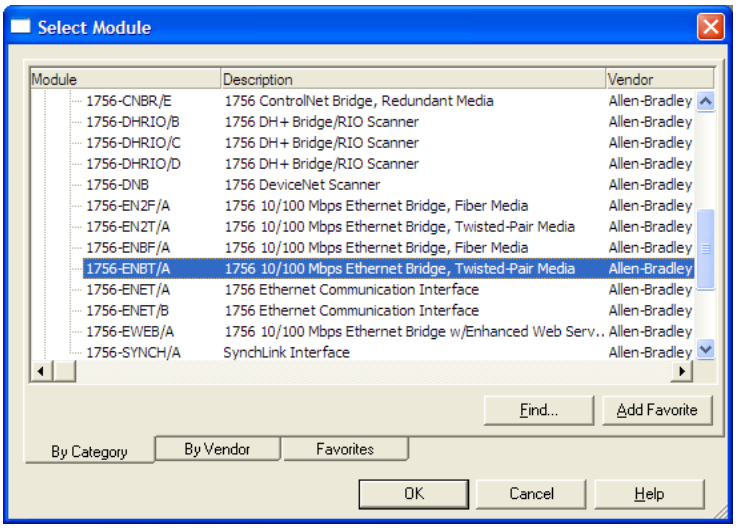


2.2 Create the Network

1 Right-click **I/O CONFIGURATION** and choose **NEW MODULE...**

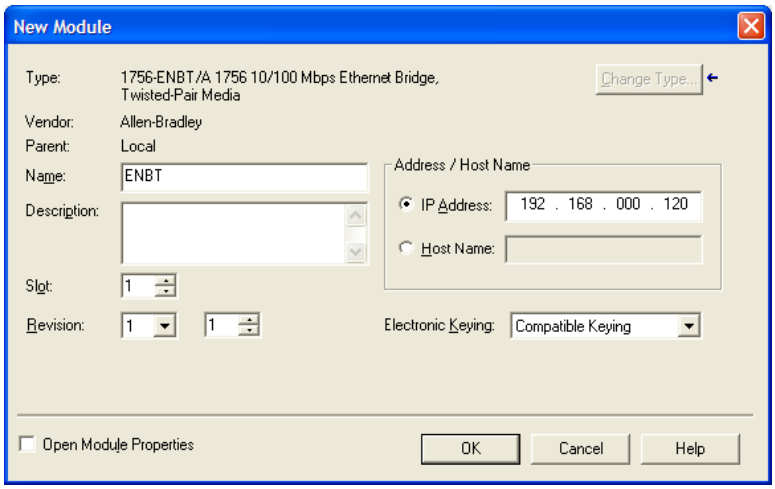


2 Expand the **COMMUNICATIONS** node, and then select the **ETHERNET BRIDGE** module that matches your hardware. This example uses a 1756-ENBT/A module.



Note: If you are prompted to "Select Major Revision", choose the lower of the available revision numbers.

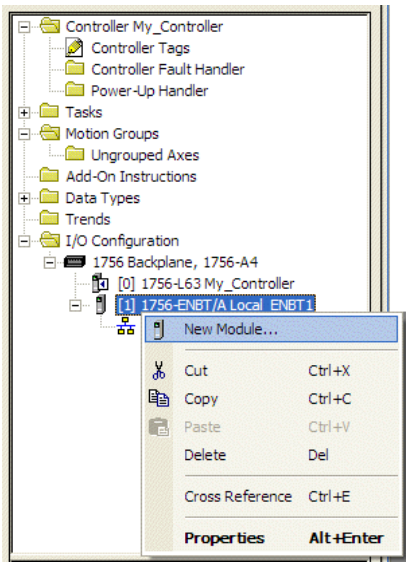
3 Name the ENBT/A module, then set the IP Address and slot location in the local rack with the ControlLogix processor.



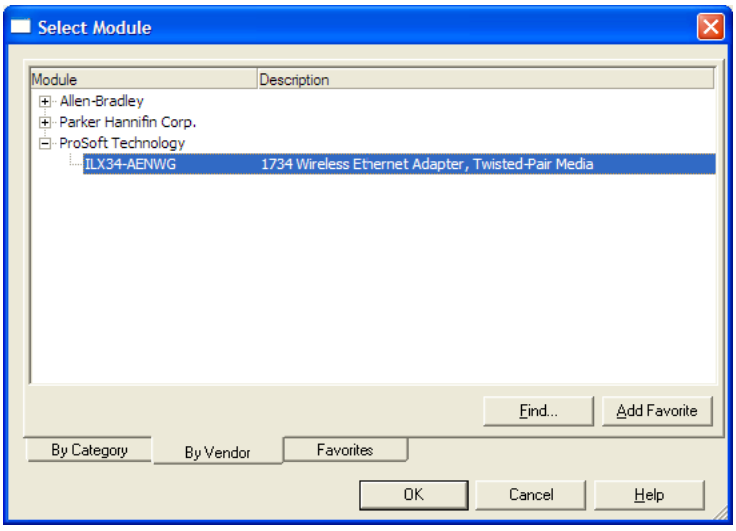
4 Click **OK**.

2.3 Create the Adapter

1 Next, select the **1756-ENBT** module that you just created in the Controller Organization pane and click the right mouse button to open a shortcut menu. On the shortcut menu, choose **NEW MODULE**.

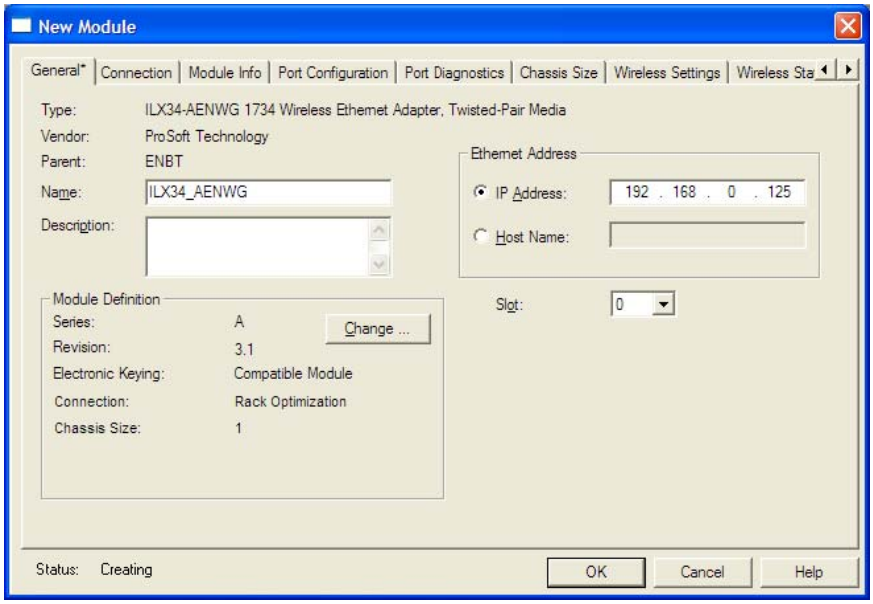


2 In the **SELECT MODULE** dialog box, click the **VENDOR** tab, and then expand the **PROSOFT TECHNOLOGY** node. Click the **BY VENDOR** tab, expand the **PROSOFT TECHNOLOGY** node, and then select **ILX34-AENWG**.



3 Name the ILX34-AENWG adapter, and set the IP address.

Important: The IP address on the ILX34-AENWG's thumbwheel switches must match the IP address you enter here.



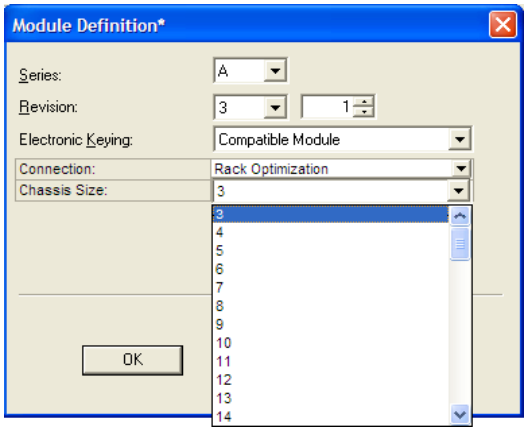
2.3.1 Configure Chassis Size

The ILX34-AENWG requires configuration of its chassis size before you can make any I/O connections. The default setting for the chassis size is 1 slot, which represents the adapter by itself, and allows for no I/O.

You must set the chassis size to a number equaling 1 slot for the adapter plus 1 slot for each I/O module present in the adapter's backplane. For example, the adapter plus 2 I/O modules uses a chassis size of 3. The adapter stores this chassis size setting in non-volatile storage.

When the adapter's non-volatile chassis size does not match the actual number of modules present on its backplane, the adapter does not make any I/O connections and an error occurs.

1 In the Module Definition area of the General tab, click the **CHANGE** button. This action opens the **MODULE DEFINITION** dialog box.



2 Select the Chassis Size for your project from the dropdown list, and then Click **OK** to close the **MODULE DEFINITION** dialog box. In a later step, you will verify the chassis size when you are online with the ILX34-AENWG (page 45).

2.4 Add POINT Modules Under the Adapter

1. Right-click the **ILX34-AENWG** adapter under I/O configuration to add a new module.

   Your second module is in slot 1.
2. Select the module from the **MODULE TYPE** list, and click **OK.**
3. In the **MODULE PROPERTIES** dialog, enter the following information:
   a) Name
   b) Slot
4. Click the **CONNECTION** tab, and set the RPI:
   - For digital modules, enter 10 ms
   - For analog or specialty modules, enter 50 ms.
5. Click **FINISH.**

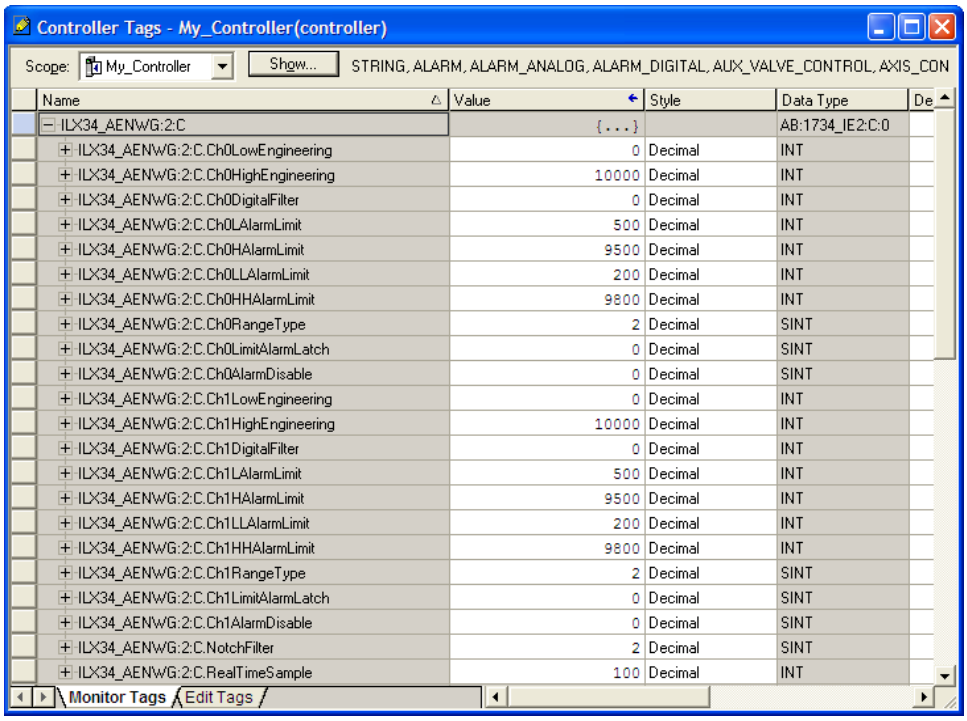
   Repeat these steps to add all of the POINT I/O modules connected to the ILX34-AENWG adapter.

2.5 Configure 1734 POINT I/O Modules

The preferred method to configure POINT I/O modules is to use the **MODULE PROPERTIES** dialog box for each POINT I/O module, as described in the User Manual for the module. The following steps show you how to configure the module by editing the Controller Tags.

1 In the **CONTROLLER ORGANIZATION** window, double-click **CONTROLLER TAGS,** and then click the **MONITOR TAGS** tab, at the bottom left corner of the Controller Tags dialog box.

Look at the bottom of the screen to make sure you are in the Monitor Tags tab.
In this example, you will configure an analog input module 1734-IE2V, installed in slot 1. You will configure Channel 0 of this module to operate over the range -10 to +10V dc.



2 Expand the configuration tag **ILX34_AENWG:2:C**.

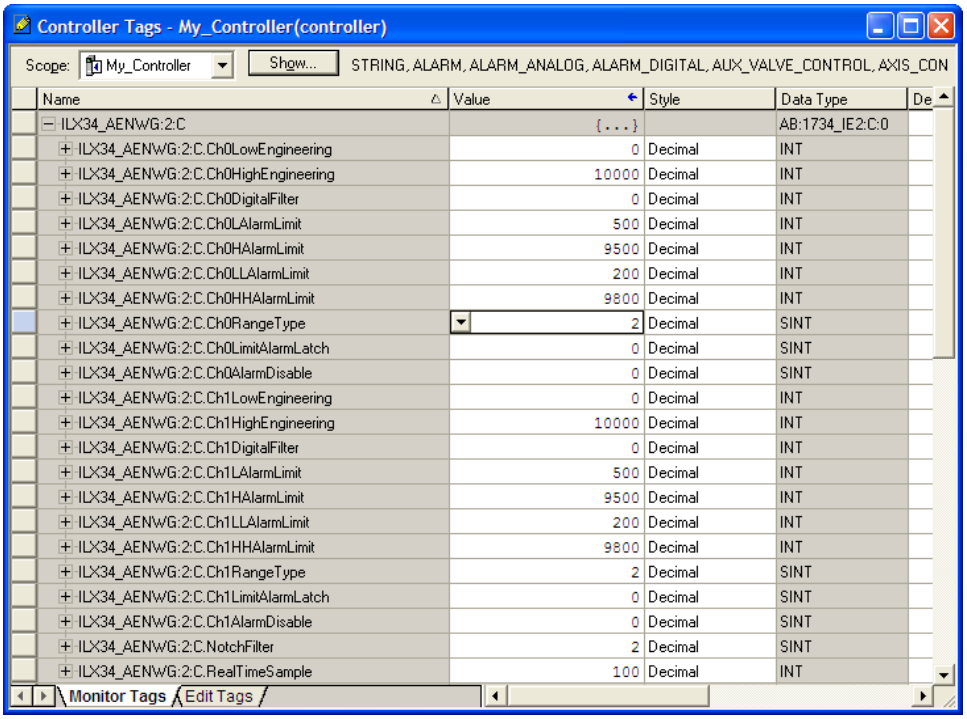
From here, you can set the module's configuration and alarms.Enter the values that would correspond to the desired range. The range type default value for a 1734-IE2V module is 2, which is equal to 0 to 10V dc.

3 Expand the configuration tag for the module in slot 4, **ILX34_AENWG:2:CH0RANGETYPE**.

4 View the value in the tag **ILX34_AENWG:2:C.Ch0RangeType**. The default value for this tag is 2.

The module supports the following Ch0Range Type values:

- 2 = 0 to 10V dc
- 0 = -10 to +10V dc



5 Click the value 2 and change it to 0, which changes the voltage range to -10 to +10V dc for channel 0.

Note the following:

- The controller sends the configuration data only when it first establishes the connection.
- After you modify any of the tag values, you must download the updated information into the module.

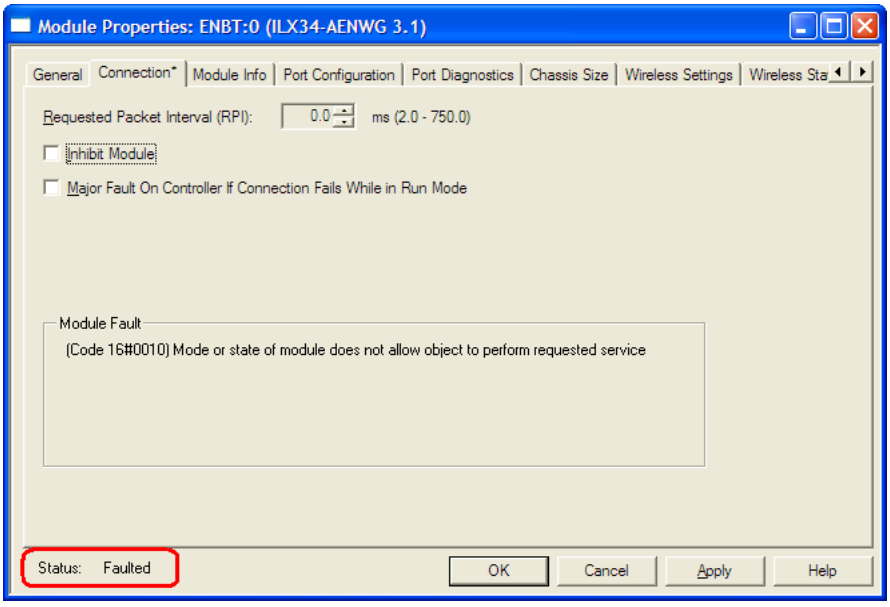
The best way to do this is to enter the correct code number in the Range Type field when you add the I/O to the I/O Configuration tree. You then download later.

If you need to change any of the module's configuration parameters after adding the module, click the **CONNECTION** tab and inhibit the module, apply the changes, and then uninhibit the module. This action breaks the connection and causes the configuration information to be downloaded right after the connection is made.

Important: Switching the controller from Program to Run mode does not change the module connection status and does not re-send module configuration data. We highly recommend that you use the inhibit/uninhibit process and avoid power cycling.

6 Right-click the ILX34-AENWG adapter and select **PROPERTIES.**

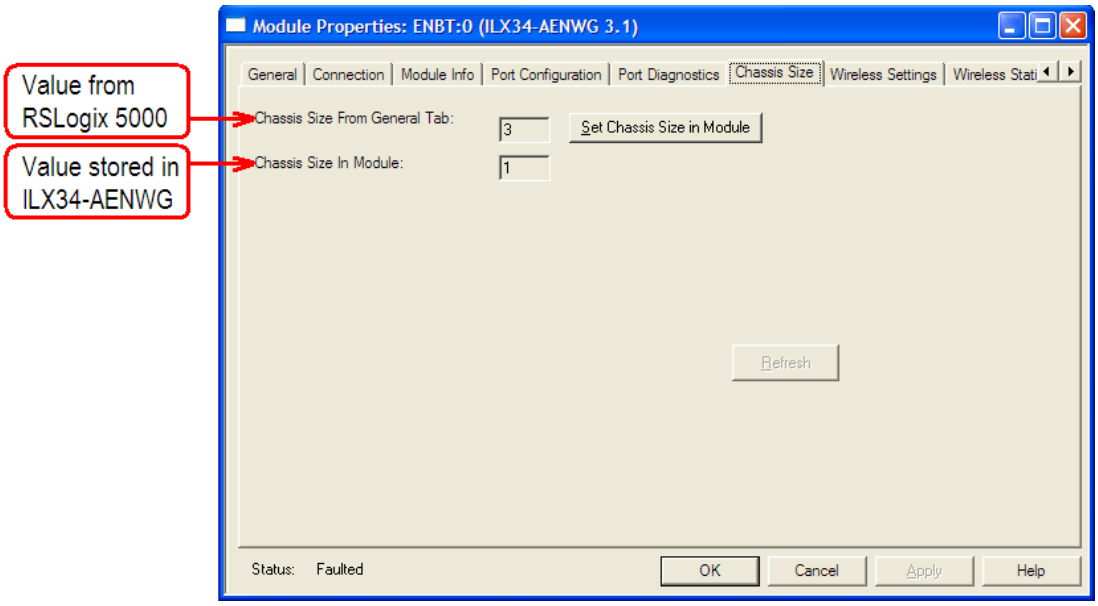
7 Click the **CONNECTION** tab. Notice that the Status message at the bottom left corner of the dialog box reads **"FAULTED".**



The module is faulted because, even though you set up the adapter's POINT I/O chassis size to the actual number of modules, plus the adapter, the adapter still remembers the size of **1** (the factory default value) until you reset this size manually.

Note: You must be online to the adapter to change this setting.

8 Click the **CHASSIS SIZE** tab.



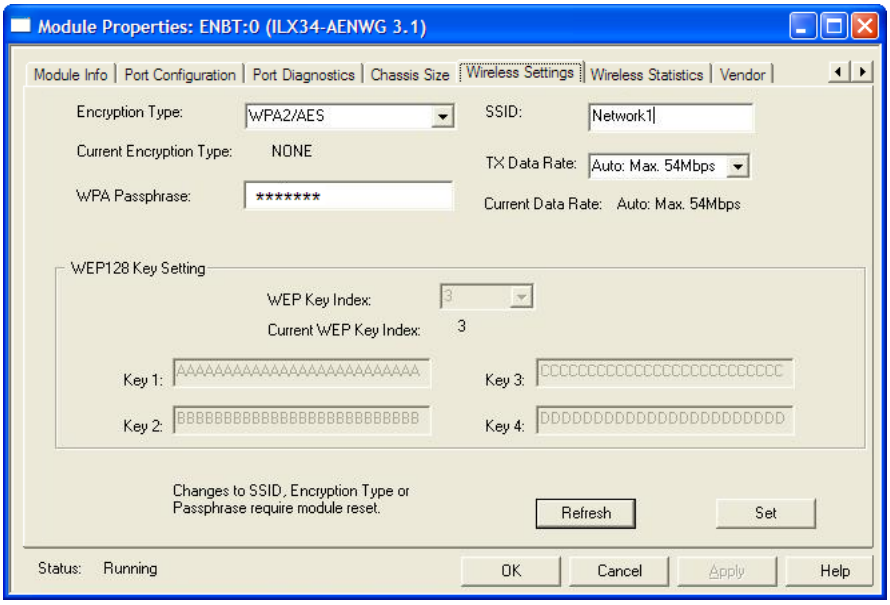
9 Click the **SET CHASSIS SIZE IN MODULE** button.

Remember to inhibit and uninhibit the module for this to take effect.
Now you can put your controller in Run mode, and the connection should be successful.

Important: The information found in Controller Tag Reference (page 133) is also available in the RSLogix 5000 online help file. Use the Help file search function under the 1734 catalog number that you are configuring and select the **Module Defined Data Types** option. You see all of the configurable parameters and associated values.

2.6 Configuring Wireless Settings in RSLogix 5000

Important: RSLogix 5000 does not save the Wireless Settings inside the project file. The Wireless Settings and Wireless Statistics tabs are populated only when the processor is online to the ILX34-AENWG.



Note: Allow sufficient time (30 to 60 seconds) for RSLogix 5000 to send and receive wireless settings from the ILX34-AENWG.

Field	Description
Encryption Type	Choose the method by which the adapter will apply encryption security: ▪ NONE (not recommended) ▪ WEP128 - Legacy security setting using a 128-bit key and WEP encryption. ▪ WPA2/AES (Preferred) - Security setting using WPA (pre-shared key) authentication and AES encryption. The preferred encryption type is AES (Advanced Encryption Standard). You should only select WEP (wired equivalency protocol) for use with an older client radio that only has WEP encryption. WEP is the original security protocol used by 802.11 networks, but AES offers better protection against attacks, for several reasons: AES uses an advanced encryption algorithm that is not susceptible to the same weaknesses as WEP, it performs dynamic key management by changing the session keys frequently, and it performs message integrity checks to prevent forgery and replay. You can also select WEP 128, or None (no encryption) as the encryption type, but none of these settings are recommended.
SSID	Assign a network name (SSID) of up to 32 characters. The radio uses this name in all network references. All radios in a network must have the same SSID. SSID names are case-sensitive.

Field	Description	
WPA Passphrase	To use WPA2/AES encryption on packets sent between the radios, enter a WPA2/AES pass phrase of between eight and 63 normal keyboard characters. This phrase automatically generates an encryption key of 128 hexadecimal characters. This field is only available if you select WPA2/AES as the encryption type.	
Transmit Data Rate	The recommended The ILX34-AENWG supports the following transmit data rates. The default value is Auto: Max 54 Mbps, and this is the recommended value for most applications.	
	1 Mbps	Auto: Max. 1 Mbps
	2 Mbps	Auto: Max. 2 Mbps
	5.5 Mbps	Auto: Max. 5.5 Mbps
	11 Mbps	Auto: Max. 11 Mbps
	18 Mbps	Auto: Max. 18 Mbps
	24 Mbps	Auto: Max. 24 Mbps
	36 Mbps	Auto: Max. 36 Mbps
	54 Mbps	Auto: Max. 54 Mbps
WEP Key Index	If using WEP128 encryption, select the Key Index that matches the Key Index used in the Access Point.	
WEP Keys (1-4)	If using WEP128 encryption, enter the WEP Keys that match the Keys in the Access Point.	

2.7 Install the Antenna

All antennas for radios communicating directly with each other should be mounted so they are within line-of-sight and have the same antenna polarity (page 188).

Antennas with a reverse polarity SMA connector can be mounted directly on the radio. Screw the antenna onto the antenna port connector until snug.

Antennas that do not have a reverse polarity SMA connector must be mounted separately and connected to the radio using a ProSoft RadioLinx adaptor cable. Because the antenna cable attenuates the RF signal, **to ensure optimum performance, use an antenna cable no longer than necessary**.

Note: The use of any antenna that is not on the ProSoft Technology approved antennas list may result in radio transmissions that violate your country's wireless regulatory laws, which may lead to civil liabilities or criminal penalties. Contact ProSoft Technology with any questions regarding antenna selection.

2.8 Test the Network Installation Plan

Test proposed installations before the installation is finalized.

After the network has been configured (page 32) and the radios have been configured (page 19):

- install the ILX34-AENWG radio in its proposed permanent location (page 19)
- cable the Configuration PC to the ILX34-AENWG
- place the Access Point and Repeater radios in their proposed locations
- temporarily place each radio's antenna near its proposed mounting location. The temporary placement of the antenna can be by hand, however, with this testing method, one person must hold the antenna while another monitors the Remote radio's signal strength (page 94) as displayed on the Configuration PC.

To improve the signal quality of each Remote's communication:

- increase the height of the antenna's placement
- use higher-gain antennas
- increase the radio's transmission power, cable the radio to the Configuration PC, and reconfigure it (page 34)
- select a new location for the Remote radio and/or its antenna
- decrease the length of antenna cable
- determine and resolve sources of "electrical" noise which may be interfering with the radio transmission
- add a repeater (page 21) between the radios that are not communicating or reconfigure an existing radio as a repeater if line of sight is available

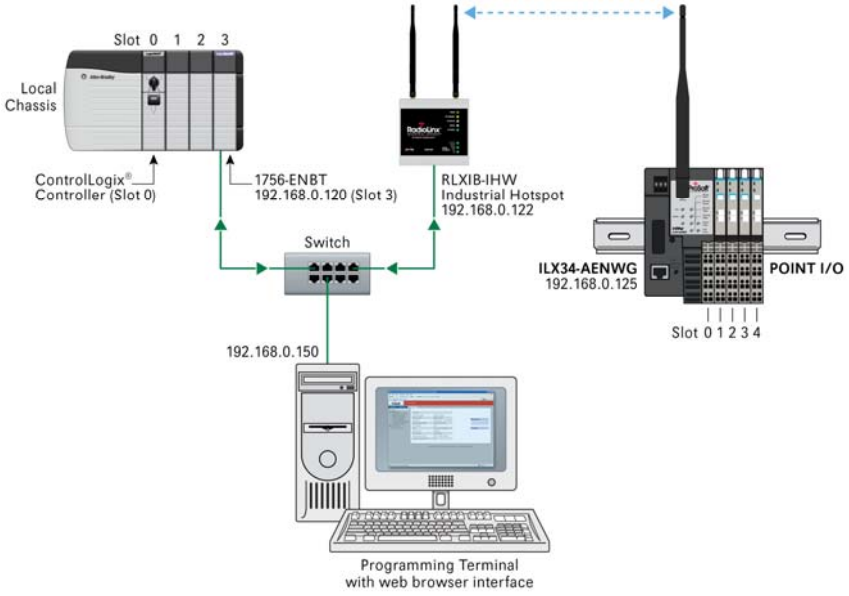
3 About the Example Applications

In This Chapter

- Support of Rack-optimized and Direct Connections 54
- System Components 55
- Set Up the Hardware 56
- Example 1 - Direct Connection and Rack Optimization 57
- Example 2 - Direct Connection 67

The following topics describe two example applications that demonstrate the procedures for configuring and communicating with POINT I/O modules using the ILX34-AENWG adapter. Use these example applications as building blocks to help you get your own system up and running. We recommend that you set up and run the example applications and use them as guides.

The following illustration shows the type of system you will be setting up.



Note: During the installation, you must connect to the ILX34-AENWG directly via Ethernet to set its wireless settings so it can communicate with its Access Point. To prevent a loop from occurring, avoid connecting Ethernet cables to the Access Point and the ILX34-AENWG at the same time after the wireless link is established.

3.1 Support of Rack-optimized and Direct Connections

The ILX34-AENWG adapter supports both direct and rack-optimized connections. A direct connection is a real-time data transfer link between the controller and whatever module occupies the slot that the configuration data references.

- Direct connection messaging occurs at a cyclic rate specified by the RPI during configuration.
- A rack-optimized connection is a grouping of data from more than one I/O module into a single block of data sent over a single connection at the same data rate.

Rack-optimized connections reduce the total number of connections needed to transfer data when using many I/O modules in a system. The following example illustrates the benefit of rack-optimized connections.

For example, a system contains 8 digital I/O modules interfaced to a ILX34-AENWG adapter. If you use direct connections to transfer data to each of these I/O modules, you need 8 connections to transfer all of the data, one to each of the 8 I/O modules. If you use a rack-optimized connection to transfer the data, you only need a single connection - the connection to the ILX34-AENWG adapter.

Important: Although rack-optimized connections offer an efficient way to use resources, there are a few limitations on their use:

- You can use only rack-optimized connections to send data to and from digital I/O modules. Analog or specialty I/O requires direct connections.
- All data is sent at the same time as the RPI rate of the ILX34-AENWG adapter.

Refer to the Rockwell Automation publication *EtherNet/IP Performance and Application Guide*, publication number ENET-AP001, for more information on connections.

3.1.1 Mix Rack-optimized and Direct Connections

You can mix communication formats for different I/O modules communicating through the same adapter. I/O modules set up to use rack optimization communicate at the rate of the RPI configured for the ILX34-AENWG adapter. I/O modules configured for direct communication communicate at their own set RPIs and ignore the ILX34-AENWG adapter's RPI.

3.2 System Components

We used the following components for the example applications. You need the same or similar components to set up your own control system using POINT I/O modules on an EtherNet/IP network.

Quantity	Product Name	Catalog Number
	Hardware	
1	Wireless POINT I/O Adapter	ILX34-AENWG
1	POINT I/O 24V dc sink output module	1734-OV4E/C
1	POINT I/O relay output module	1734-OW2/C
1	DIN rail	199-DR1 or equivalent
1	ControlLogix chassis	1756-A4, (or 1756-A7, 1756-A13,1756-A17)
1	ControlLogix power supply	1756-PA72, (or 1756-PB72)
1	ControlLogix controller	1756-L5* with firmware version 17
1	ControlLogix EtherNet/IP bridge module	1756-ENBT with firmware version 4.007 or higher
1	RadioLinx Industrial Hotspot	RLXIB-IHW
1	Personal computer that supports RSLogix 5000 software	Any appropriate model running Windows NT 4.0, Service Pack 6A or higher
1	Ethernet switch	Refer to manufacturer's specifications
1	24V dc power supply	
	Associated media and connectors as needed	
	Software	
1	RSLinx communications software, version 2.54.00 or later	9355-WAB, 9355-WABOEM, 9355-WABC
1	RSLogix 5000 programming software, version 17 or later	9324-RLD300ENE

3.3 Set Up the Hardware

In these examples, a ControlLogix chassis contains the Logix controller in slot 0, and a 1756-ENBT bridge module in slot 3. We mounted the ILX34-AENWG adapter on a DIN rail in slot 0, with a 1734-OW2/C relay output module in slot 1, a 1734-OV4E/C sink output module in slot 2, and a 24 volt DC power supply.

To work along with this example, set up your system as follows.

- Note that the example application, the Logix controller and 1756-ENBT module (firmware revision 4.007 or later) uses the slots shown in the illustration (page 53).
- Verify the IP addresses for your programming terminal, 1756-ENBT module, and ILX34-AENWG adapter.
- Verify the position (slot) of the I/O modules on the DIN rail.
- Verify that you have properly connected all wiring and cabling.
- You must configure your communication driver (such as AB_ETH-1 or AB-ETHIP-1) in RSLinx software, as described in Configure the RSLinx Ethernet Communication Driver.

3.4 Example 1 - Direct Connection and Rack Optimization

This example configures your ILX34-AENWG for both direct connection and rack optimization using RSLogix 5000 software.

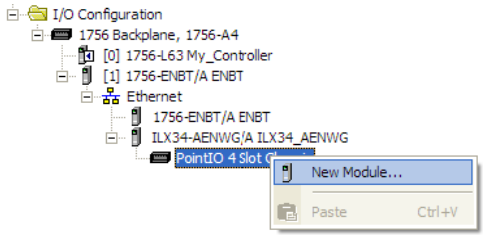
You can mix communication formats for different I/O modules communicating through the same adapter.

- I/O modules set up to use rack optimization communicate at the rate of the RPI configured for the ILX34-AENWG adapter.
- I/O modules configured for direct communication communicate at their own set RPI and ignore the ILX34-AENWG adapter RPI.

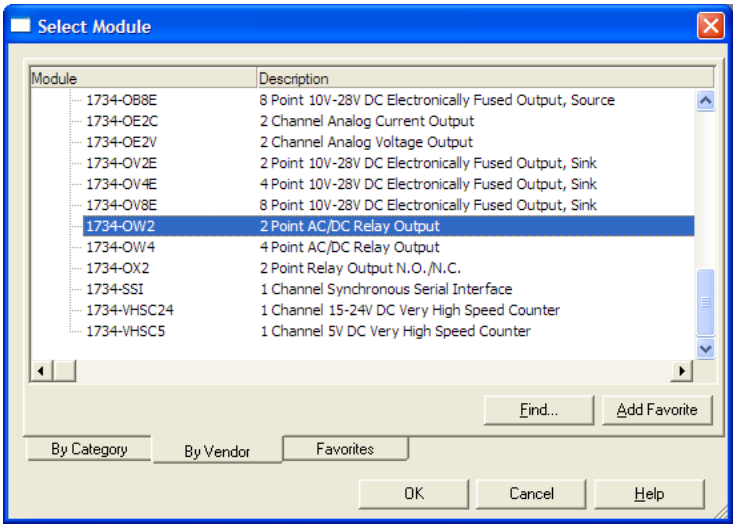
Attention: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

3.4.1 Add the Relay Output Module and Configure for Direct Connection

1 Right-click the ILX34-AENWG adapter under the I/O Configuration folder and select **NEW MODULE**.

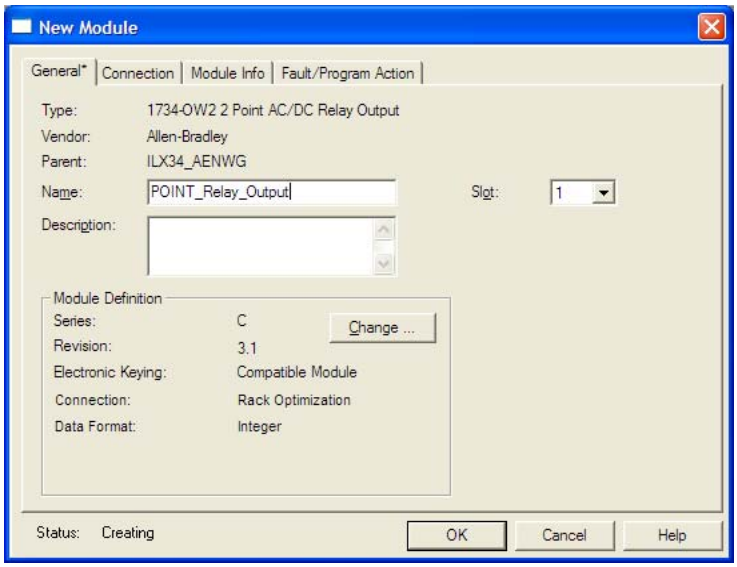


2 In the **SELECT MODULE** dialog box, choose the **1734-OW2** relay output module from the list, and click **OK**.

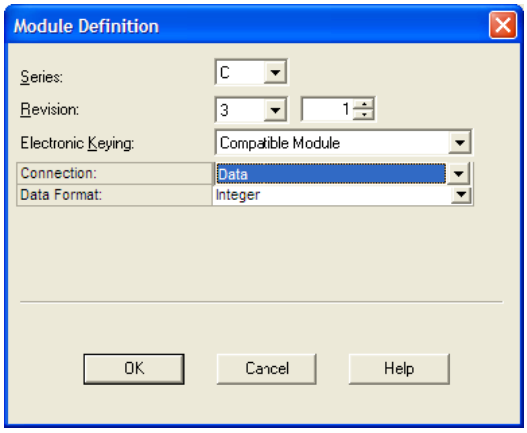


3 In the **MODULE PROPERTIES** dialog, enter the following information:

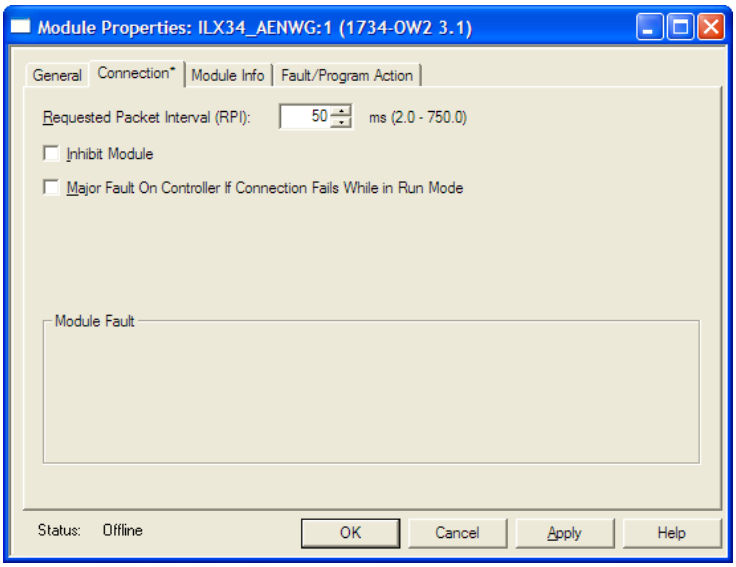
a) Name
b) Slot



In the Module Definition area, click the **CHANGE ...** button, and change the Connection type from Rack Optimization (default) to **DATA**.



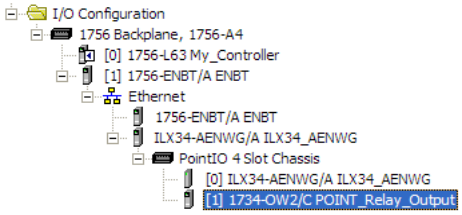
4 Click the **CONNECTION** tab, and then change the RPI value for the module from 20 (the default) to 50 (the recommended value for analog or specialty modules). This value determines how often to exchange data with the ILX34-AENWG adapter.



Important: To avoid overloading the ILX34-AENWG adapter, we recommend that RPI be no less than 10 ms for rack connections and 50 ms for direct connections.

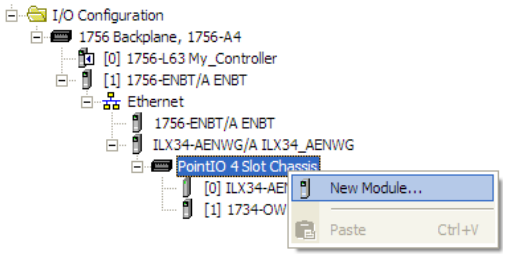
5 Click **OK** save the configuration.

The following illustration shows the I/O Configuration for this project.

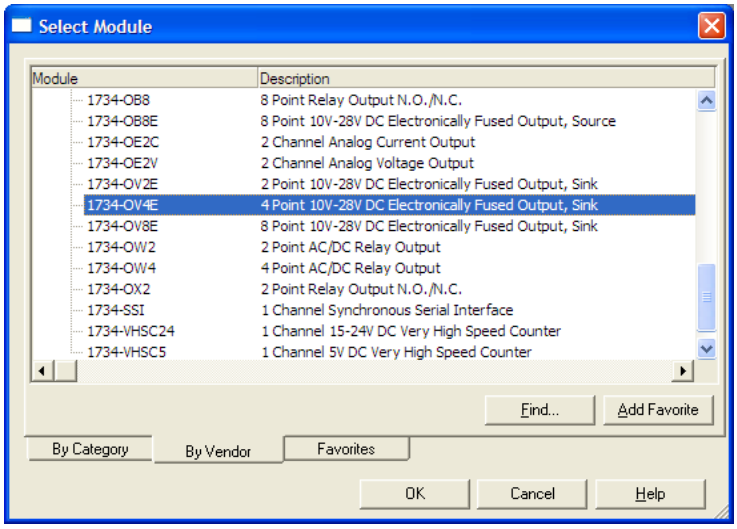


3.4.2 Add the Digital Output Module and Configure for Rack Optimization

1 Right-click the ILX34-AENWG adapter under the I/O Configuration folder and select **NEW MODULE**.

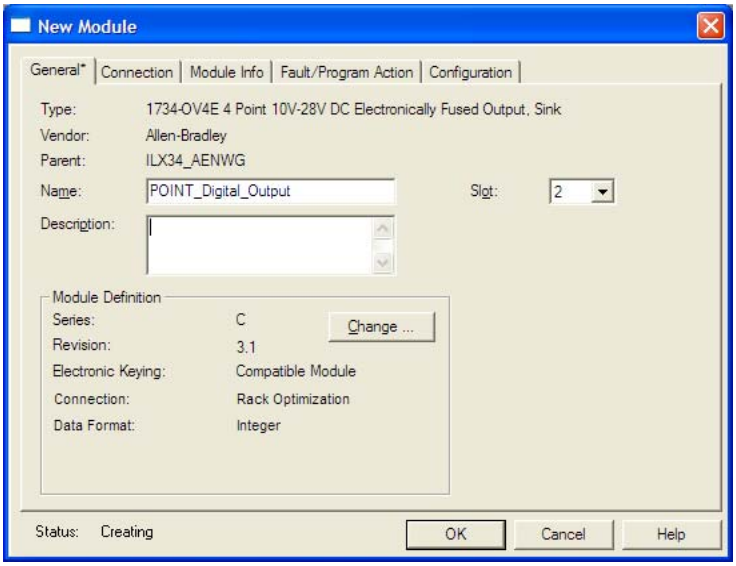


2 In the **SELECT MODULE** dialog box, choose the **1734-OV4E** digital output module from the list, and click **OK**.



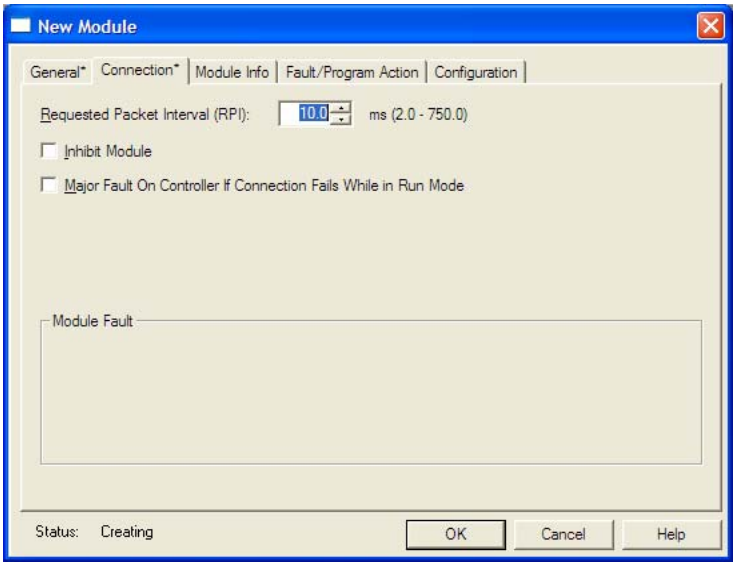
3 In the **MODULE PROPERTIES** dialog, enter the following information:

a) Name
b) Slot



In the **MODULE DEFINITION** area of the dialog box, notice that the default Connection type is **RACK OPTIMIZATION**.

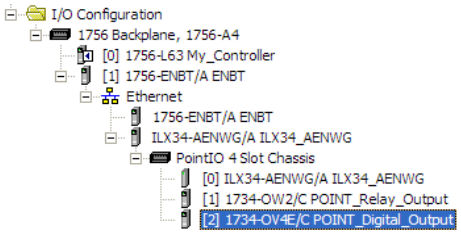
4 Click the **CONNECTION** tab, and then change the RPI value for the module from 20 (the default) to 10 (the recommended value for digital modules). This value determines how often to exchange data with the ILX34-AENWG adapter.



Important: To avoid overloading the ILX34-AENWG adapter, we recommend that RPI be no less than 10 ms for rack connections and 50 ms for direct connections.

5 Click **OK** save the configuration.

The following illustration shows the I/O Configuration for this project.

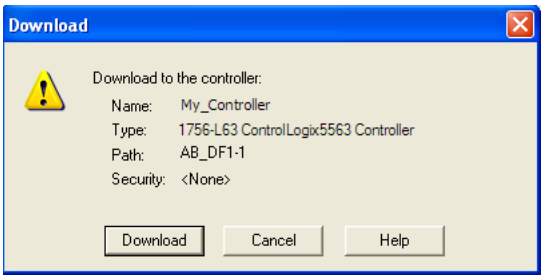


3.4.3 Downloading the Sample Program to the Processor

Note: The key switch on the front of the ControlLogix processor must be in the REM or PROG position.

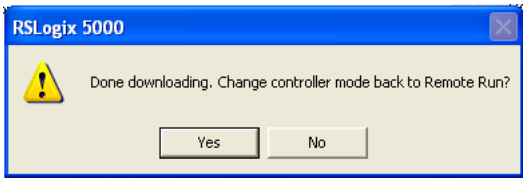
1 If you are not already online with the processor, open the *Communications* menu, and then choose **DOWNLOAD**. RSLogix 5000 will establish communication with the processor. You do not have to download through the processor's serial port, as shown here. You may download through any available network connection.

2 When communication is established, RSLogix 5000 will open a confirmation dialog box. Click the **DOWNLOAD** button to transfer the sample program to the processor.



3 RSLogix 5000 will compile the program and transfer it to the processor. This process may take a few minutes.

4 When the download is complete, RSLogix 5000 will open another confirmation dialog box. If the key switch is in the REM position, click **OK** to switch the processor from PROGRAM mode to RUN mode.



Note: If you receive an error message during these steps, refer to your RSLogix documentation to interpret and correct the error.

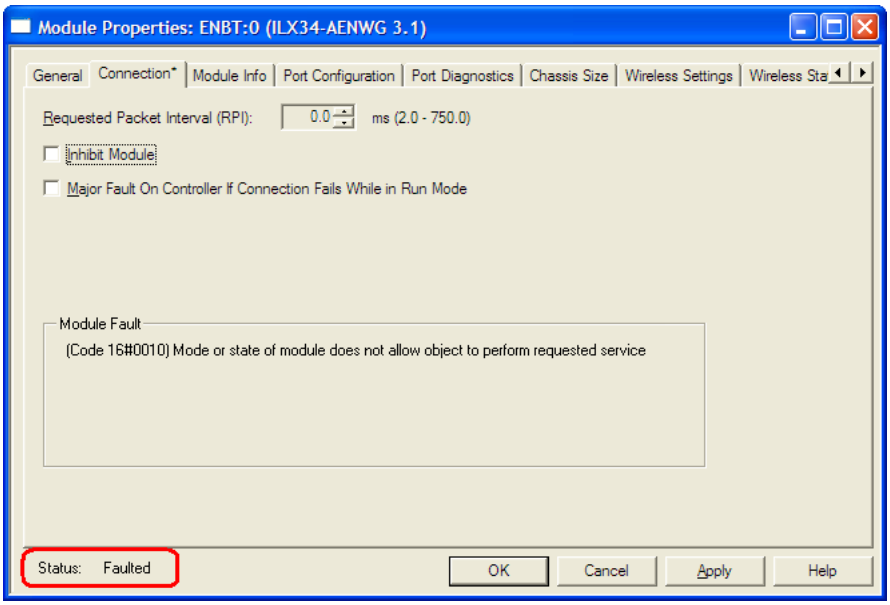
3.4.4 Verify the Chassis Size

You must configure the chassis size for the ILX34-AENWG before you can make any I/O connections (page 43). The default setting for the chassis size is 1 slot, which represents the adapter by itself.

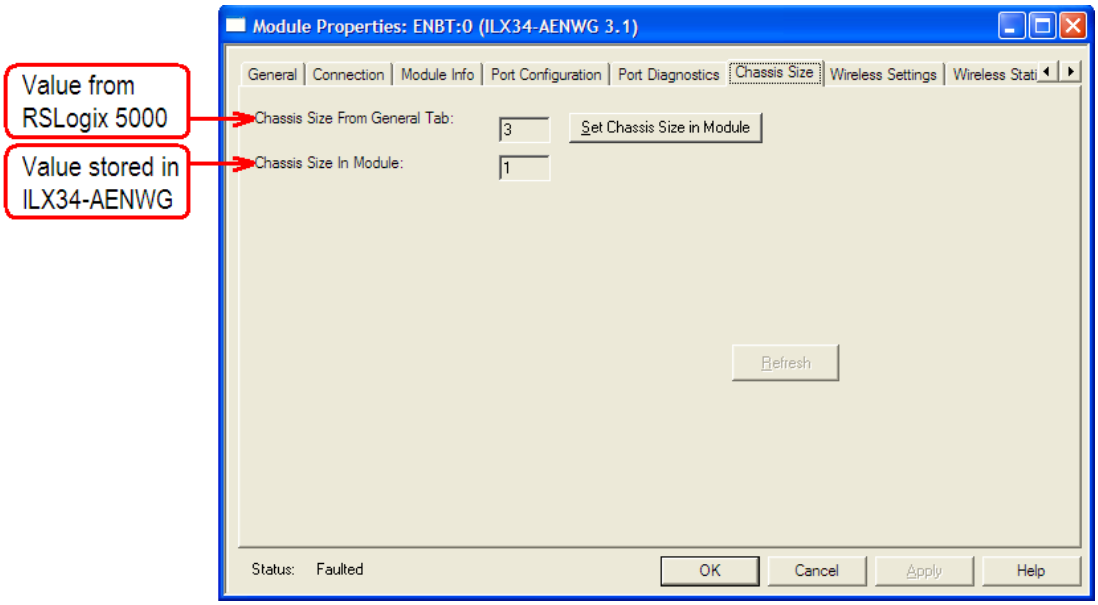
When the adapter's non-volatile chassis size does not match the actual number of modules present on its backplane, the adapter does not make any I/O connections and an error occurs, as shown in the **MODULE PROPERTIES** dialog box.

This procedure synchronizes the chassis size value from the RSLogix 5000 software into the ILX34-AENWG hardware. You must be online to perform this procedure.

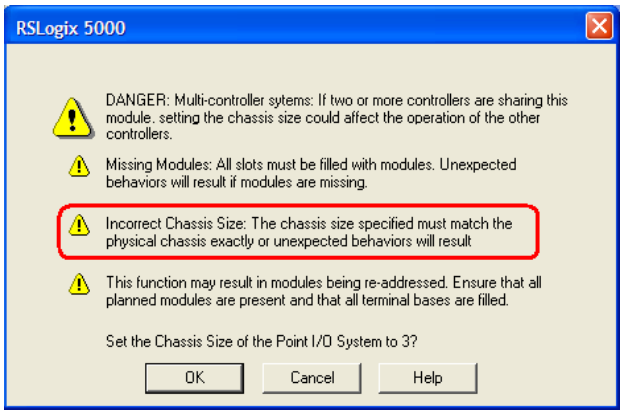
1. Verify that RSLogix 5000 software is online to the processor.
2. Double-click the **ILX34-AENWG** adapter under **I/O CONFIGURATION** in the **CONTROLLER ORGANIZATION** window. This action opens the **MODULE PROPERTIES** dialog box.
3. On the **MODULE PROPERTIES** dialog box, click the **CONNECTION** tab. Notice that the **MODULE FAULT** area of the dialog box contains information about the error code.



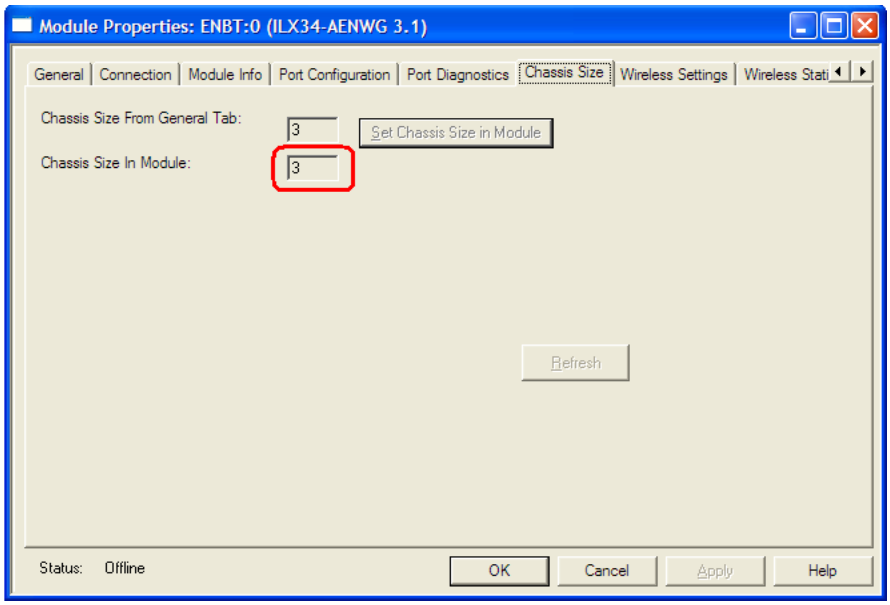
4 Click the **CHASSIS SIZE** tab, and then click the **CLICK SET CHASSIS SIZE IN MODULE** button.



5 This action opens a notification dialog box. Take any necessary steps to prevent hazardous conditions, and then click **OK** to dismiss the dialog box.


RSLogix 5000
DANGER: Multi-controller sytems: If two or more controllers are sharing this module, setting the chassis size could affect the operation of the other controllers.
Missing Modules: All slots must be filled with modules. Unexpected behaviors will result if modules are missing.
Incorrect Chassis Size: The chassis size specified must match the physical chassis exactly or unexpected behaviors will result
This function may result in modules being re-addressed. Ensure that all planned modules are present and that all terminal bases are filled.
Set the Chassis Size of the Point I/O System to 3?
OK
Cancel
Help

6 Notice the chassis size in the module has been updated to match the hardware configuration.



7 Click **OK** to dismiss the Module Properties dialog box.

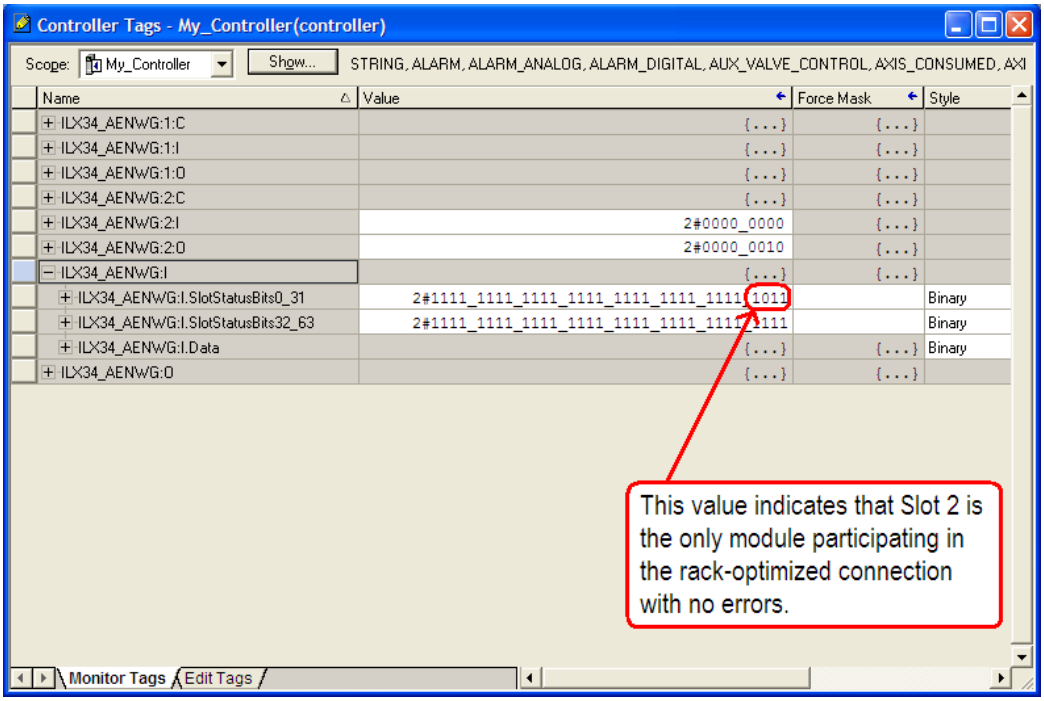
At this point, your POINTBus status LED should be solid green. All the yellow triangles in your I/O configuration should be gone.

8 Open the **FILE** menu, and then click **SAVE** to save the project.

3.4.5 View Module Data

You can view module data and communication status in the controller tags in RSLogix 5000. The following illustration shows the ILX34-AENWG configured with the sample application.

- POINT_IO_Adapter = the name you gave to your Ethernet adapter
- # = slot number of POINT I/O module
- C = configuration, I = input, O = output



Use the controller tags in your ladder program to read input data or write output data.

- Slot Status Bits: The Slot Status bits display the connection status for each of the POINT I/O modules that use a rack-optimized connection.
- Bit 0 is reserved for the adapter and always reports a value of 1.
- Each of the other bits (1 to 63) correspond to a POINT I/O module that you install in the POINT I/O backplane.
- In this example, we configured the ILX34-AENWG adapter for both rack-optimized and direct connections.
- The slot status bits indicate that the module in slot 2 is operating correctly:
  - 0=module participating with no errors and
  - 1=module not participating or connection error (typically, module removed/missing)

3.5 Example 2 - Direct Connection

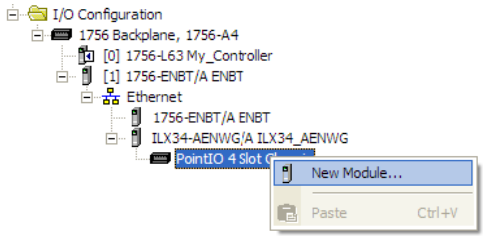
In this example, a ControlLogix controller communicates with POINT I/O modules via the ILX34-AENWG adapter using a direct connection.

The adapter makes a direct connection to each of the modules referenced by the data.

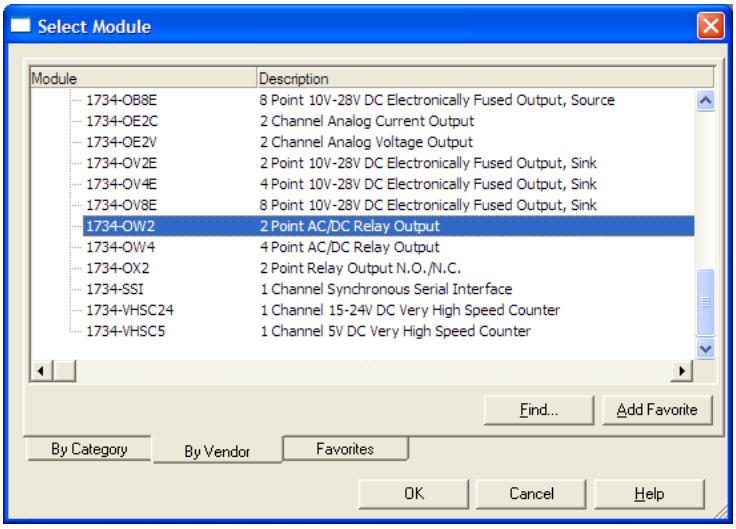
Attention: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

3.5.1 Add the Relay Output Module and Configure for Direct Connection

1 Right-click the ILX34-AENWG adapter under the I/O Configuration folder and select **NEW MODULE**.

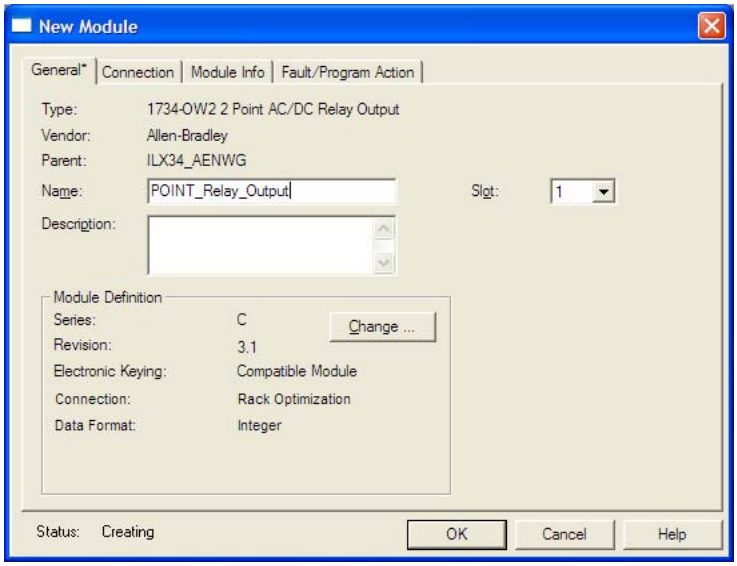


2 In the **SELECT MODULE** dialog box, choose the **1734-OW2** relay output module from the list, and click **OK**.

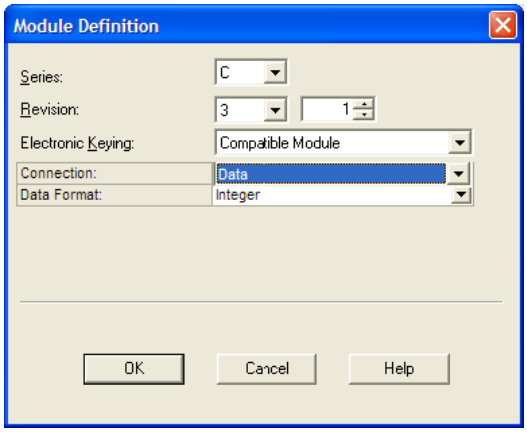


3 In the **MODULE PROPERTIES** dialog, enter the following information:

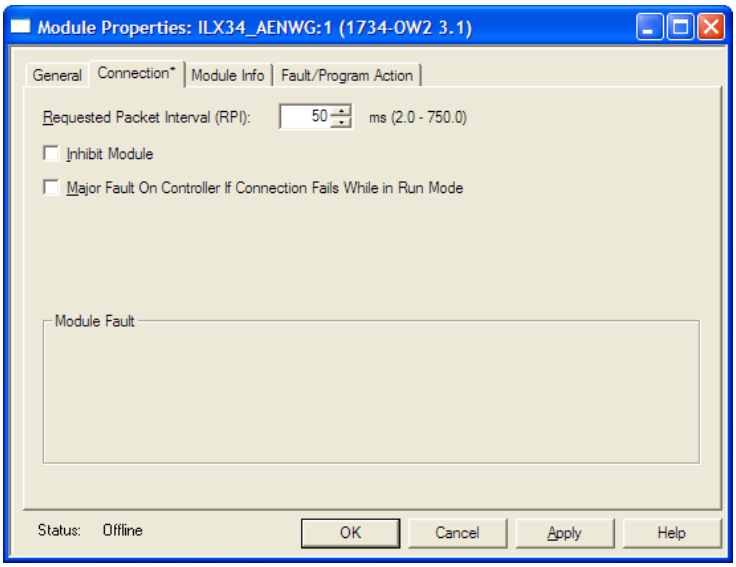
a) Name
b) Slot



In the Module Definition area, click the **CHANGE ...** button, and change the Connection type from Rack Optimization (default) to **DATA**.



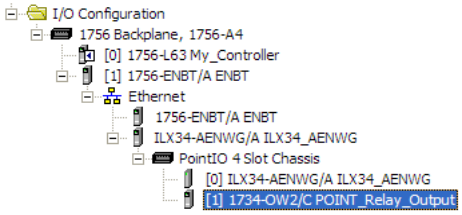
4 Click the **CONNECTION** tab, and then change the RPI value for the module from 20 (the default) to 50 (the recommended value for analog or specialty modules). This value determines how often to exchange data with the ILX34-AENWG adapter.



Important: To avoid overloading the ILX34-AENWG adapter, we recommend that RPI be no less than 10 ms for rack connections and 50 ms for direct connections.

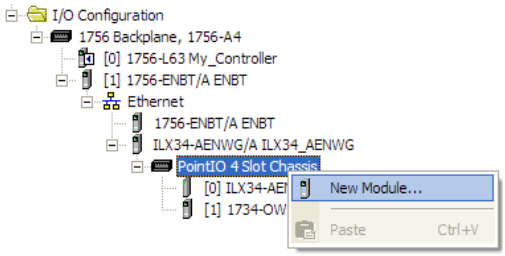
5 Click **OK** save the configuration.

The following illustration shows the I/O Configuration for this project.

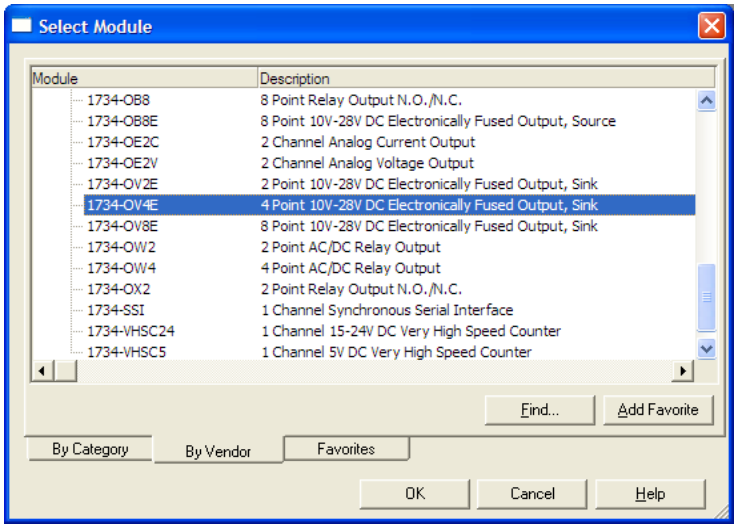


3.5.2 Add the Digital Output Module and Configure for Direct Connection

1 Right-click the ILX34-AENWG adapter under the I/O Configuration folder and select **NEW MODULE**.

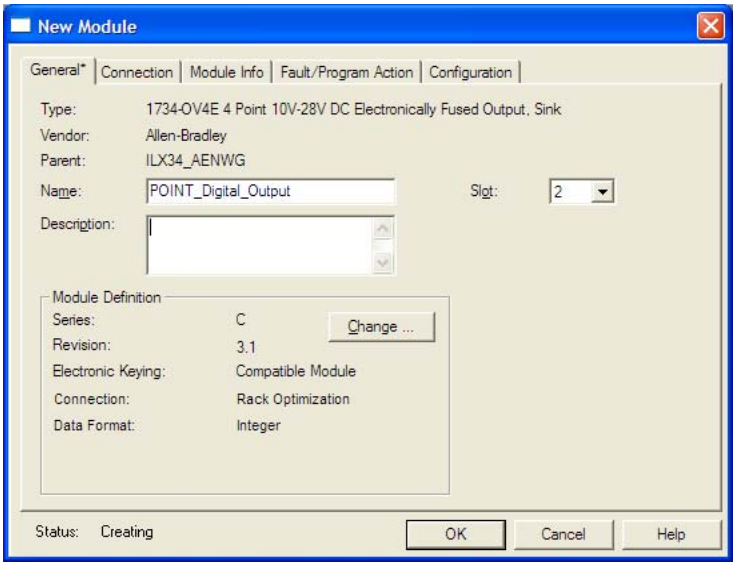


2 In the **SELECT MODULE** dialog box, choose the **1734-OV4E** digital output module from the list, and click **OK**.

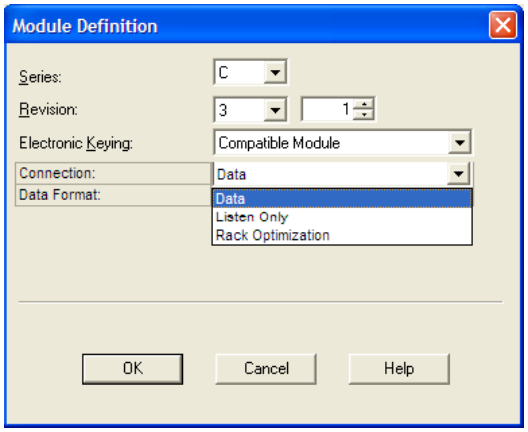


3 In the **MODULE PROPERTIES** dialog, enter the following information:

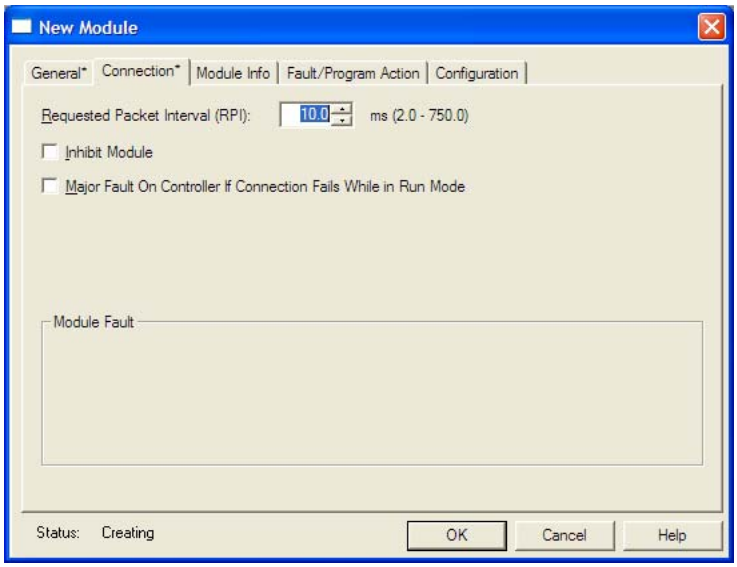
a) Name
b) Slot



In the Module Definition area, click the **CHANGE ...** button, and change the Connection type from Rack Optimization (default) to **DATA**.

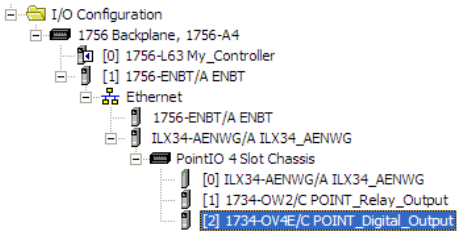


4 Click the **CONNECTION** tab, and then change the RPI value for the module from 20 (the default) to 10 (the recommended value for digital modules). This value determines how often to exchange data with the ILX34-AENWG adapter.



5 Click **OK** save the configuration.

The following illustration shows the I/O Configuration for this project.

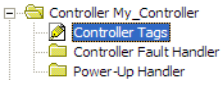


3.5.3 Edit the Controller Tags

When you add modules to the I/O configuration, the system creates tags for those modules to use in the application program.

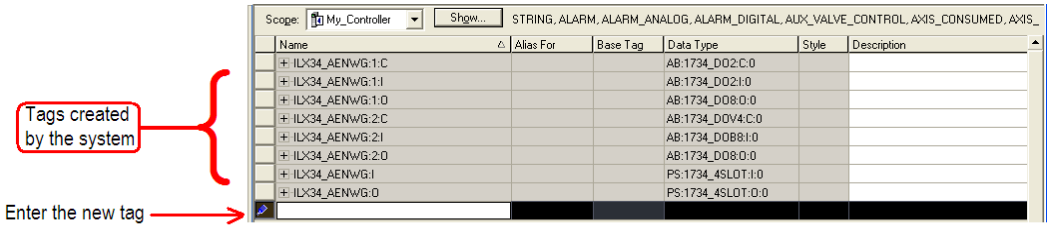
For the example application, you need to add one more controller tag.

1 Double-click the **CONTROLLER TAGS** folder in the project dialog.



The action opens the **CONTROLLER TAGS** dialog box. You will see the tags created for the ILX34-AENWG adapter and digital I/O modules.

2 Click the Edit Tags tab at the bottom of the Controller Tags dialog.



3 Create the following tag:

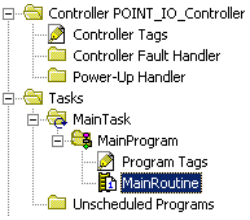
Tag	Type
Parts_Count	Counter

4 Close the Controller Tags dialog.

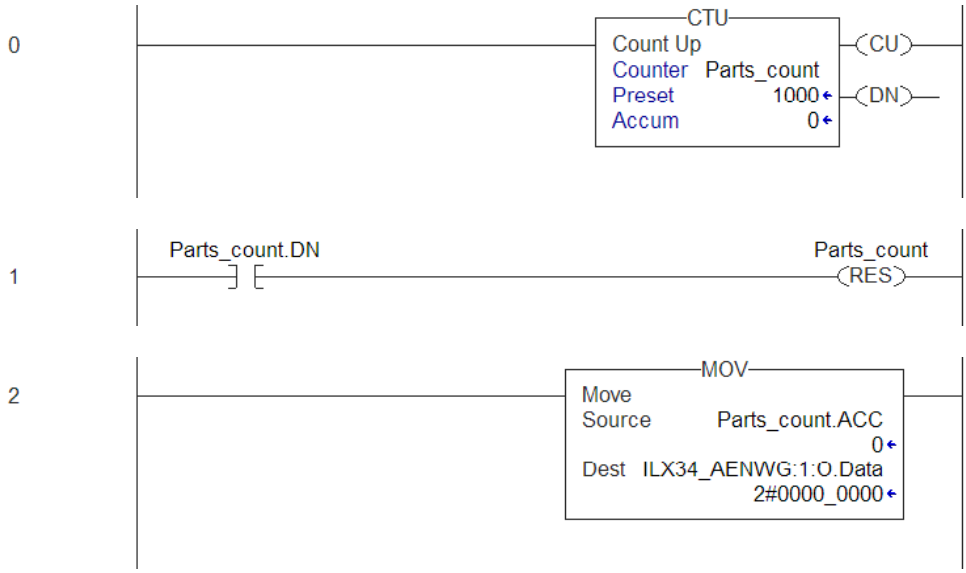
3.5.4 Create the Ladder Program

Next, create the example ladder program to test the I/O.

1 Double-click **MAIN ROUTINE** under the Main Program folder.



2 Enter the following ladder program using the tags previously created.

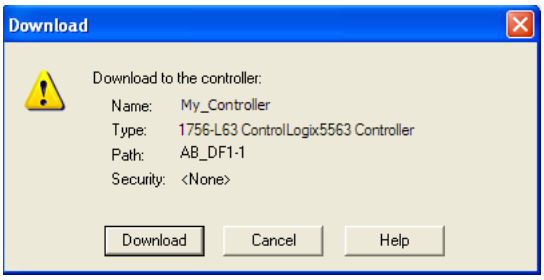


3 Save the program.

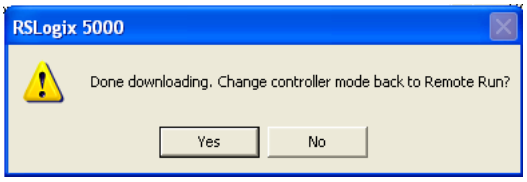
3.5.5 Downloading the Sample Program to the Processor

Note: The key switch on the front of the ControlLogix processor must be in the REM or PROG position.

1. If you are not already online with the processor, open the *Communications* menu, and then choose **DOWNLOAD**. RSLogix 5000 will establish communication with the processor. You do not have to download through the processor's serial port, as shown here. You may download through any available network connection.
2. When communication is established, RSLogix 5000 will open a confirmation dialog box. Click the **DOWNLOAD** button to transfer the sample program to the processor.



3. RSLogix 5000 will compile the program and transfer it to the processor. This process may take a few minutes.
4. When the download is complete, RSLogix 5000 will open another confirmation dialog box. If the key switch is in the REM position, click **OK** to switch the processor from PROGRAM mode to RUN mode.



Note: If you receive an error message during these steps, refer to your RSLogix documentation to interpret and correct the error.

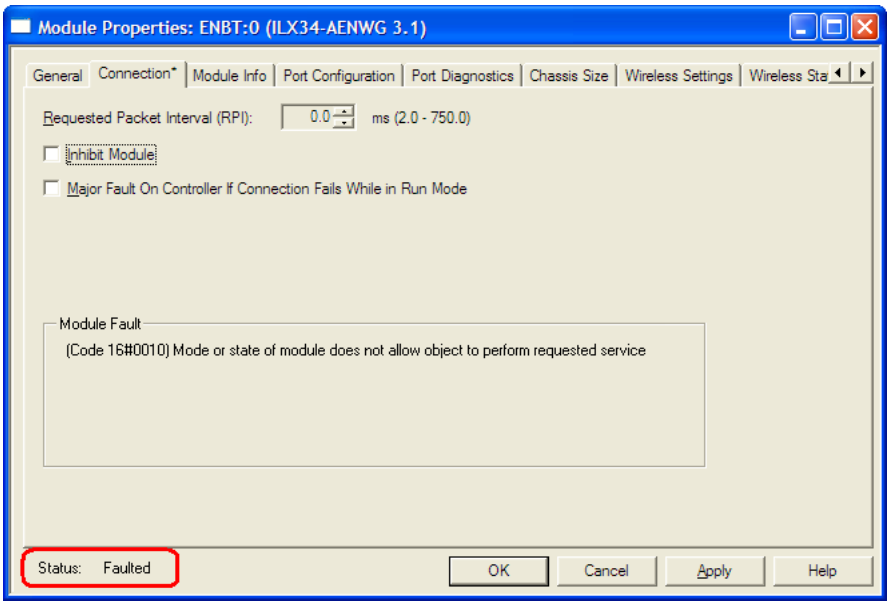
3.5.6 Verify the Chassis Size

You must configure the chassis size for the ILX34-AENWG before you can make any I/O connections (page 43). The default setting for the chassis size is 1 slot, which represents the adapter by itself.

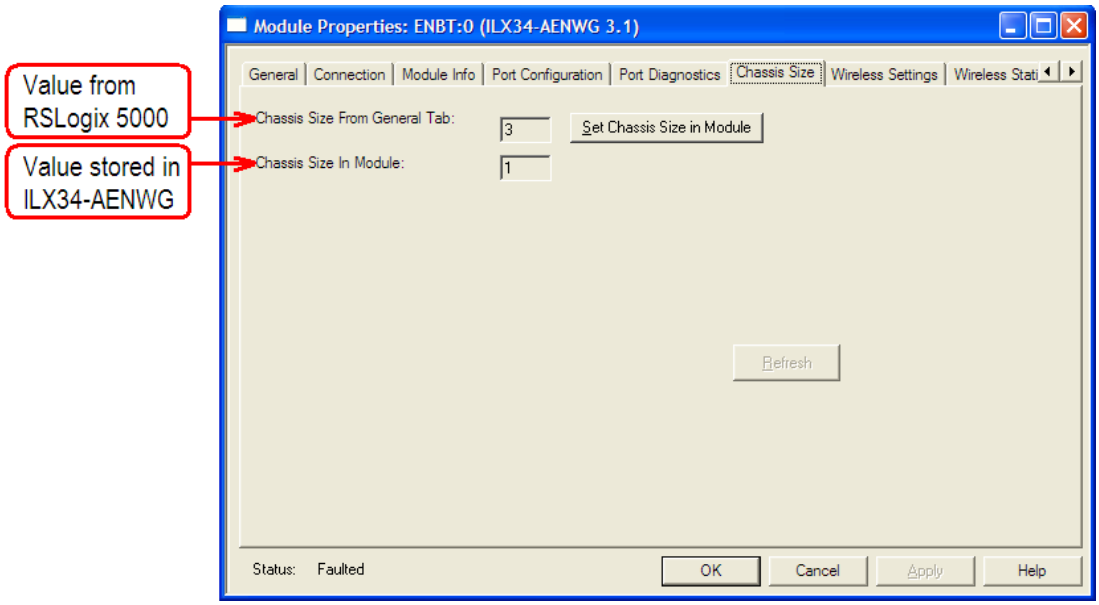
When the adapter's non-volatile chassis size does not match the actual number of modules present on its backplane, the adapter does not make any I/O connections and an error occurs, as shown in the **MODULE PROPERTIES** dialog box.

This procedure synchronizes the chassis size value from the RSLogix 5000 software into the ILX34-AENWG hardware. You must be online to perform this procedure.

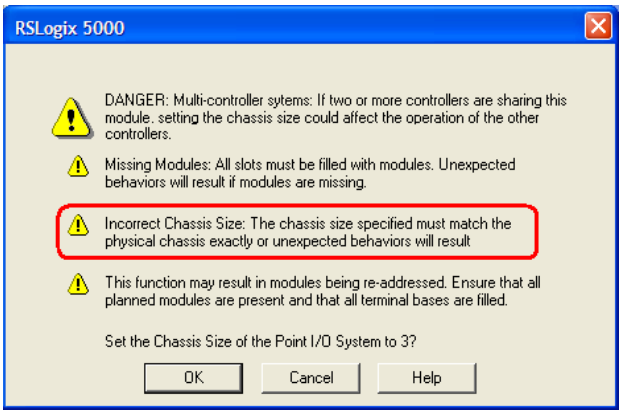
1. Verify that RSLogix 5000 software is online to the processor.
2. Double-click the **ILX34-AENWG** adapter under **I/O CONFIGURATION** in the **CONTROLLER ORGANIZATION** window. This action opens the **MODULE PROPERTIES** dialog box.
3. On the **MODULE PROPERTIES** dialog box, click the **CONNECTION** tab. Notice that the **MODULE FAULT** area of the dialog box contains information about the error code.



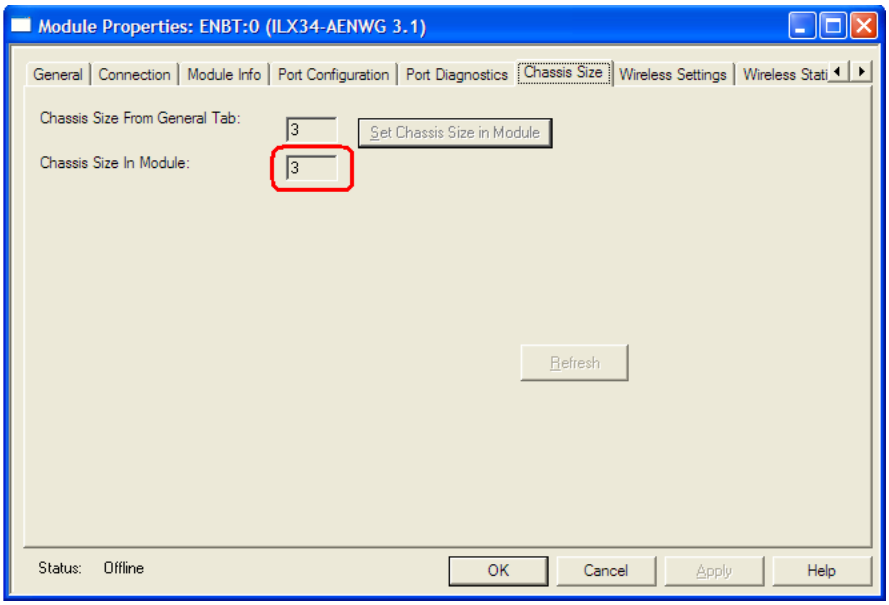
4 Click the **CHASSIS SIZE** tab, and then click the **CLICK SET CHASSIS SIZE IN MODULE** button.



5 This action opens a notification dialog box. Take any necessary steps to prevent hazardous conditions, and then click **OK** to dismiss the dialog box.


RSLogix 5000
DANGER: Multi-controller sytems: If two or more controllers are sharing this module. setting the chassis size could affect the operation of the other controllers.
Missing Modules: All slots must be filled with modules. Unexpected behaviors will result if modules are missing.
Incorrect Chassis Size: The chassis size specified must match the physical chassis exactly or unexpected behaviors will result
This function may result in modules being re-addressed. Ensure that all planned modules are present and that all terminal bases are filled.
Set the Chassis Size of the Point I/O System to 3?
OK
Cancel
Help

6 Notice the chassis size in the module has been updated to match the hardware configuration.



7 Click **OK** to dismiss the Module Properties dialog box.

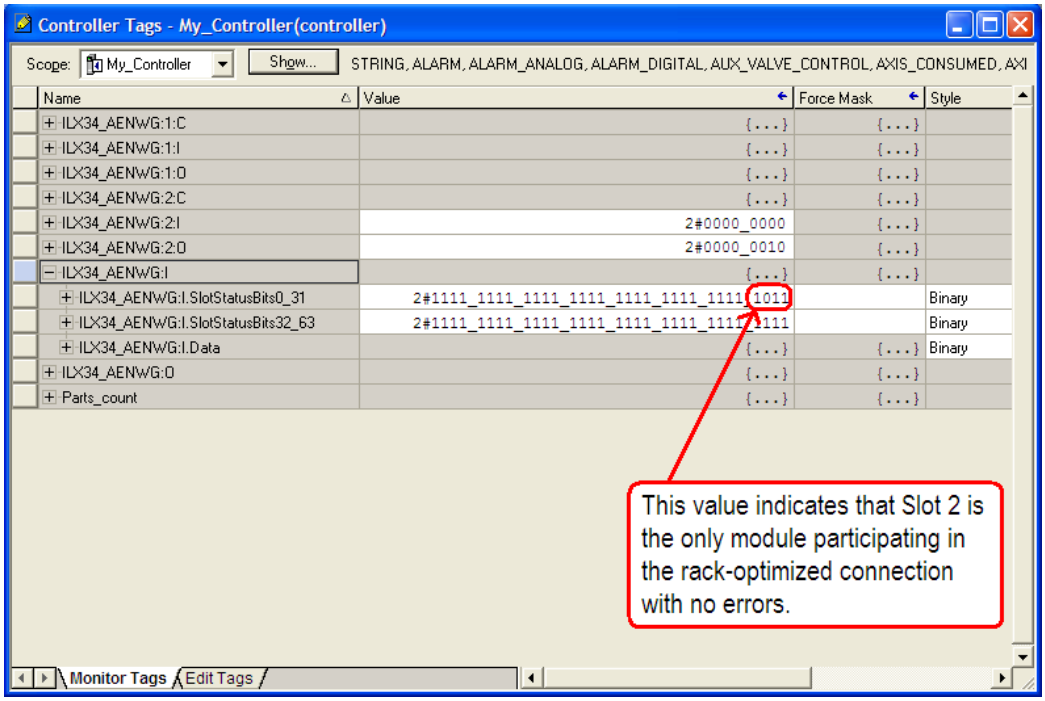
At this point, your POINTBus status LED should be solid green. All the yellow triangles in your I/O configuration should be gone.

8 Open the **FILE** menu, and then click **SAVE** to save the project.

3.5.7 View Module Data

You can view module data and communication status in the controller tags in RSLogix 5000. The following illustration shows the ILX34-AENWG configured with the sample application.

- ILX34_AENWG = the name you gave to your Ethernet adapter
- # = slot number of POINT I/O module
- C = configuration, I = input, O = output



Use the controller tags in your ladder program to read input data or write output data.

- Slot Status Bits: The Slot Status bits display the connection status for each of the POINT I/O modules that use a rack-optimized connection.
- Bit 0 is reserved for the adapter and always reports a value of 1.
- Each of the other bits (1 to 63) correspond to a POINT I/O module that you install in the POINT I/O backplane.
- In this example, we configured the ILX34-AENWG adapter for both rack-optimized and direct connections.
- The slot status bits indicate that the module in slot 2 is operating correctly:
  - 0=module participating with no errors and
  - 1=module not participating or connection error (typically, module removed/missing)

4 Diagnostics and Troubleshooting

In This Chapter

- Connect to the Adapter's Web Page 82
- Viewing Wireless Statistics in RSLogix 5000 105
- Establish I/O Connections 107
- Recover From an Overloaded Adapter 107
- Empty Slots and RIUP Situations 108
- LED Status Indicators 109
- Check the Ethernet cable 112
- Restoring the Factory Default Network Settings 114
- Restoring the All Factory Default Settings 116
- Installing a Replacement Wireless POINT I/O Adapter to an Existing System 117
- Upgrading to Firmware Version 3.5.0 118

Diagnostics values are available through the following user interfaces:

- Web Interface (page 83)
- RSLogix 5000 (page 105)
- EtherNet/IP Object (page 184)

4.1 Connect to the Adapter's Web Page

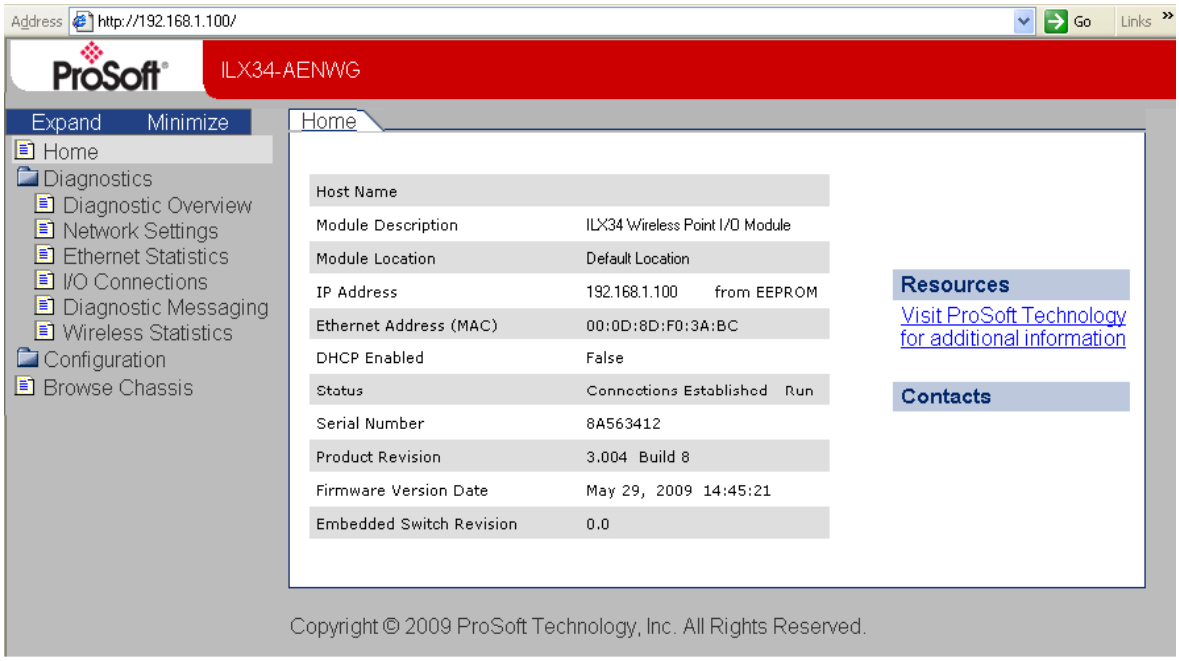
Open your web browser (for example, Microsoft Internet Explorer or Firefox), and connect to the adapter's temporary network address.

http://192.168.1.xxx
(where xxx is the value you entered in the rotary switches on the front of the adapter.)

Important: Your PC must be on the same TCP/IP subnet as the adaptor to view these pages.
Important: You must prefix the numeric IP address with "`http://`", otherwise the web browser may not be able to interpret the address.

The adapter's home page consists of a tree view in the left pane for navigation, and an information pane in the middle. The right column contains links for additional resources and information.

- To view the contents of a folder, click the **EXPAND** button.
- To select a page to view, click the page title in the tree view.



If you are unable to connect to the adapter's web page, verify that your PC is correctly configured to reach IP addresses on the subnet where your adapter communicates.

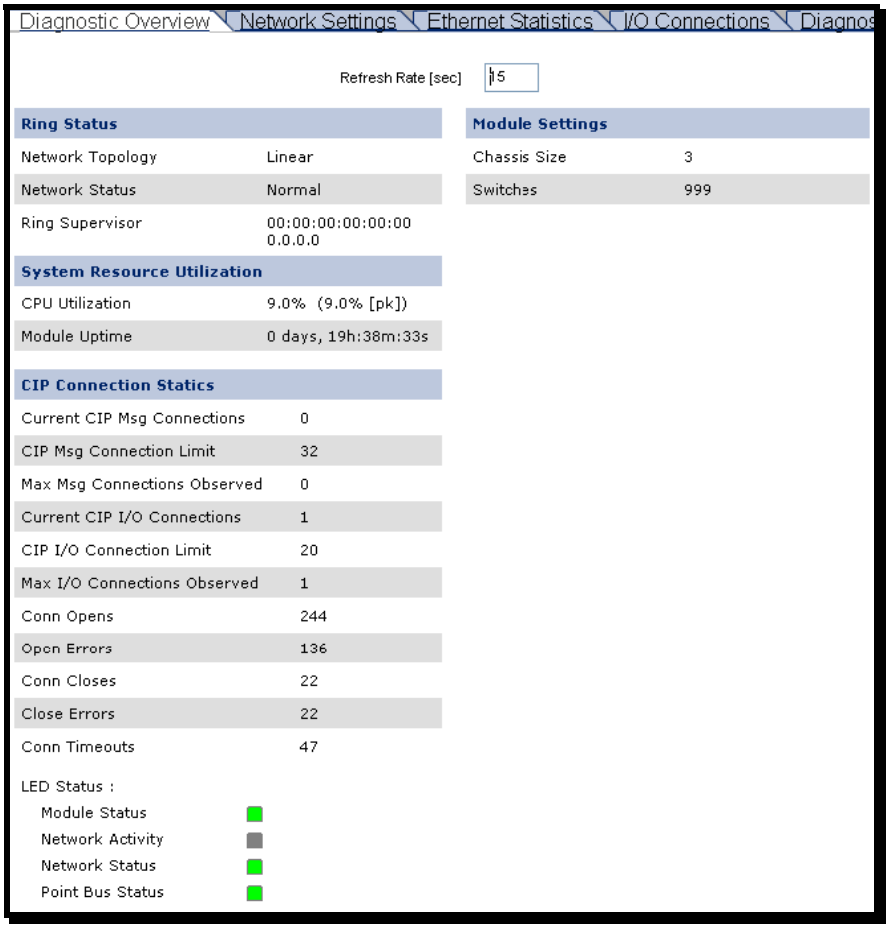
4.1.1 Diagnostics Pages

The **DIAGNOSTICS** pages show you current operational information about your POINT I/O adapter and connected devices. Select the **DIAGNOSTICS** folder in the tree view on the left side of the page, and click **EXPAND** to view the menu, or click the tabs at the top of the page.

The Diagnostics pages automatically refresh at 15 second intervals. To change the refresh interval, enter a value in seconds in the **REFRESH RATE (SEC)** field at the top of the page.

Diagnostic Overview Page

The **DIAGNOSTIC OVERVIEW** page opens when you select the **DIAGNOSTICS** folder in the menu on the left side of the page. Use this page to view the ILX34-AENWG adapter's current configuration and status.



Ring Status

Field	Description
Network Topology	Reserved for future use. This value will always be "Linear"
Network Status	Reserved for future use. This value will always be "Normal"
Ring Supervisor	Reserved for future use. This value will always be zeros for the MAC Address and IP Address.

System Resource Utilization

Field	Description
CPU Utilization	Indicates the percentage of the time the adaptor's CPU (Central Processing Unit) is working. Peak CPU utilization is shown in parentheses.
Module Uptime	The amount of time the adaptor has been powered up and operating, since the last power cycle.

CIP Connection Statistics

Field	Description
Current CIP Msg Connections	The number of CIP Msg connections that are currently open. In most cases, CIP messages are issued for diagnostic purposes from ladder logic, and not for regular Input and Output data.
CIP Msg Connection Limit	The ILX34-AENWG can support up to 32 CIP Msg connections.
Max Msg Connections Observed	The maximum number of CIP Msg connections that have occurred at one time since the unit was reset.
Current CIP I/O Connections	The number of I/O connections that are currently open. Note that several I/O slices can be Rack Optimized into a single connection. If this number matches the number of connections expected, the unit is fully operational.
CIP I/O Connection Limit	The ILX34-AENWG can support up to 20 connections. Although up to 63 I/O modules can be connected to the ILX34, these must be rack optimized to fit into the limit of 20 connections.
Max I/O Connections Observed	The maximum number of connections that have occurred at one time since the unit was reset.
Conn Opens	Number of times that an I/O (or possibly a Msg) connection open request has been received from the controller.
Open Errors	Number of times that there has been an error in establishing the I/O connection when the open request has been received.
Conn Closes	Number of times the connection has been closed. This value can indicate a problem in the RF traffic that has caused a timeout, causing the connection to close.
Close Errors	Number of times an error has occurred when the controller is attempting to close a connection. These errors can be caused by a timeout, because a loss of communication could prevent all of the packets that would normally occur during a close to be transferred in a timely manner.

Field	Description
Conn Timeouts	Timeouts occur when the controller does not receive packets from an I/O connection within the RPI requirements. The timeout occurs within 4 x RPI value. If the controller has not heard from the I/O in 4 RPI times, it times out. The minimum timeout value is 100ms. Therefore, even if the RPI is 4ms, a timeout will not occur until no packets have been heard from the I/O in over 100ms. If the number of timeouts is high, the network traffic is likely too high.

LED Status:

Field	Description
Module Status	Flashing red = an error condition Solid green = functioning properly
Network Activity	Rapidly flashing green = successful data transfer activity Slowly flashing green = an issue or difficulty within the network Flashing red = an error condition
Network Status	Flashing green = an error condition Solid green = functioning properly
Point Bus Status	Flashing red = an error condition Solid green = functioning properly

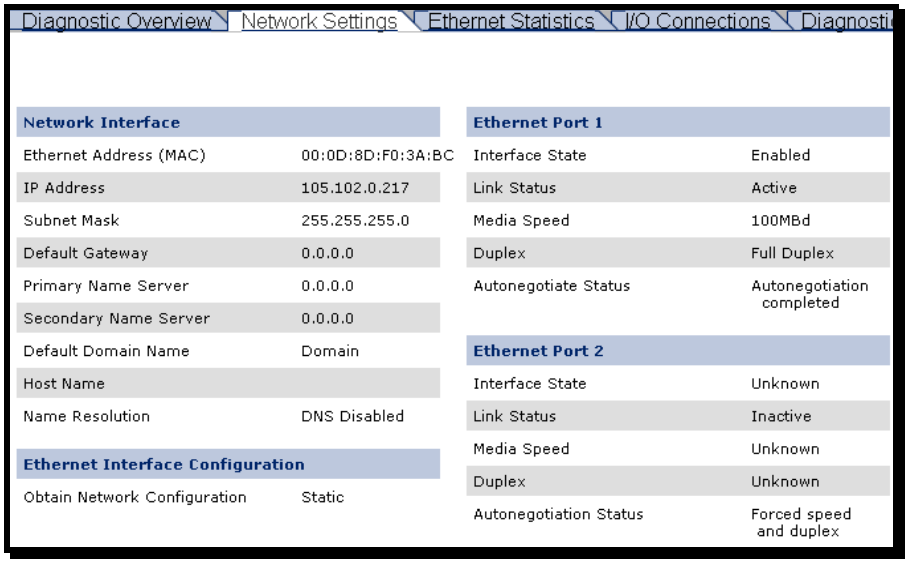
Module Settings

Field	Description
Chassis Size	Displays the chassis size that is stored in the adapter. (page 63)
Switches	Displays the configuration of the thumbwheel switches on the face of the ILX34-AENWG adapter (page 25)

Network Settings Page

The **NETWORK SETTINGS** page opens when you expand the **DIAGNOSTICS** folder, and then click the **NETWORK SETTINGS** link on the left side of the page. Use this page to view configuration and status information for the Ethernet and Antenna ports on the ILX34-AENWG.

Note: The values on this page are for information only, and cannot be modified. To change these values, use the Network Configuration Page (page 98).



Network Interface

Field	Description
Ethernet Address (MAC)	The MAC address (hexadecimal) of the ILX34-AENWG adapter
IP Address	The IP address identifies each node on the IP network (or system of connected networks). Each TCP/IP node on a network (including the Ethernet module) must have a unique IP address.
Subnet Mask	Subnet mask for the host interface. Allows communication with a subnet behind the host interface.
Default Gateway	The IP address of a network router where data is sent if the destination IP address is outside the local subnet. The gateway is the device that routes the traffic from the local area network to other networks such as the Internet.
Primary Name Server	The IP address of the primary DNS server to use for resolving (or translating) names to IP addresses
Secondary Name Server	The IP address of the secondary DNS server to use for resolving (or translating) names to IP addresses
Default Domain Name	A name that identifies one or more IP addresses
Host Name	The Fully Qualified Domain Name (FQDN)
Name Resolution	Indicates if DNS is enabled or disabled.

Ethernet Interface Configuration

Field	Description
Obtain Network Configuration	Static or Dynamic

Ethernet Port 1 / 2

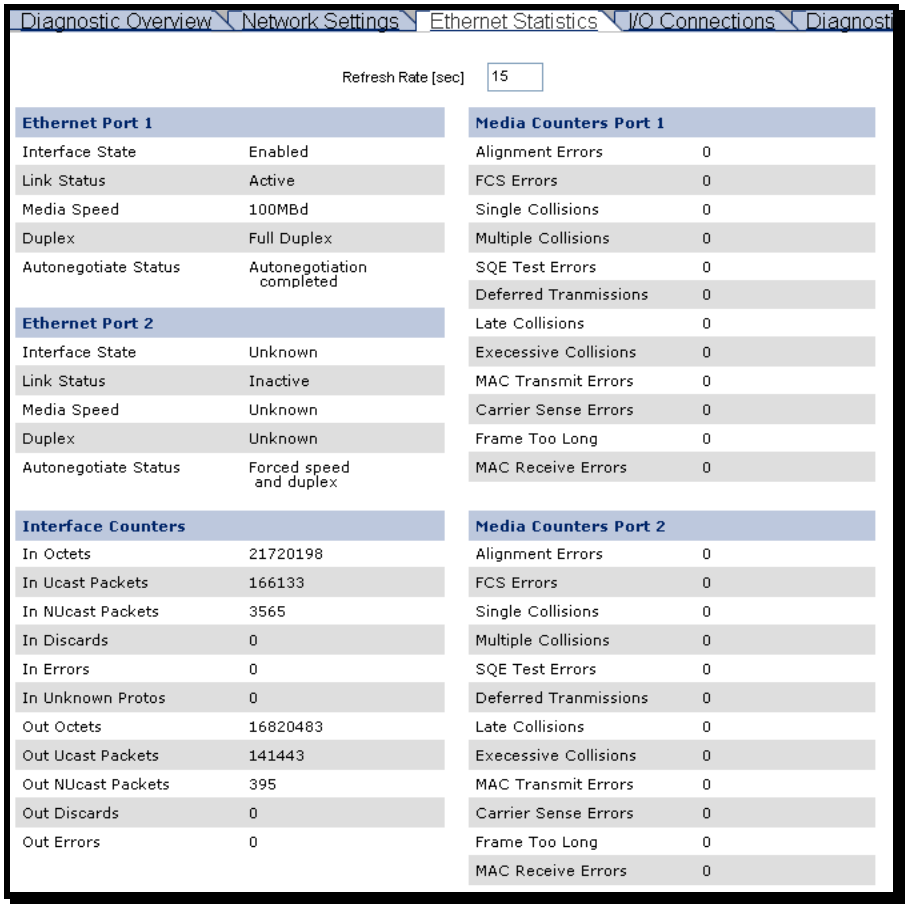
Ethernet Port 1 is an internal connection to the Wireless port. These statistics will not change and do not reflect the status of the wireless connection.

Field	Description
Interface State	Enabled or Disabled. Any other condition indicates a problem.
Link Status	Active or Inactive. Port 1 will always display "Active".
Media Speed	10 megabits or 100 megabits
Duplex	Half Duplex or Full Duplex
Autonegotiation Status	Autonegotiate Speed and Duplex, or Force Speed and Duplex

Ethernet Statistics Page

The **ETHERNET STATISTICS** page opens when you expand the **DIAGNOSTICS** folder, and then click the **ETHERNET STATISTICS** link on the left side of the page. Use this page to view detailed status information for the Ethernet and Antenna ports on the ILX34-AENWG.

Note: The values on this page are for information only, and cannot be modified. To change these values, use the Network Configuration Page (page 98).



Ethernet Port 1 / 2

Ethernet Port 1 is an internal connection to the Wireless port. These statistics will not change and do not reflect the status of the wireless connection.

Field	Description
Interface State	Enabled or Disabled. Any other condition indicates a problem.
Link Status	Active or Inactive. Port 1 will always display "Active".
Media Speed	10 megabits or 100 megabits
Duplex	Half Duplex or Full Duplex
Autonegotiation Status	Autonegotiate Speed and Duplex, or Force Speed and Duplex

Interface Counters

Field	Description
In Octets	Number of octets (bytes) received
In Ucast Packets	Number of unicast packets received
In NUcast Packets	Number of broadcast and multicast packets received
In Discards	Number of received packets that have been discarded
In Errors	Number of packets received with CRC errors
In Unknown Protos	Number of packets received with unknown protocols
Out Octets	Number of octets (bytes) transmitted
Out Ucast Packets	Number of unicast packets transmitted
Out NUcast Packets	Number of broadcast and multicast packets transmitted
Out Discards	Number of sent packets that have been discarded
Out Errors	Number of packets sent with CRC errors

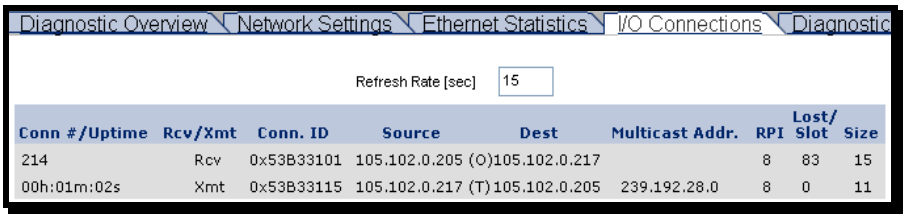
Media Counters Port 1 / 2

Field	Description
Alignment Errors	A count of frames received on a particular interface that are not an integral number of octets in length and do not pass the FCS check. Alignment Errors can result from MAC layer packet formation problems, cabling problems that cause corrupted or lost data, and packets that pass through more than two cascaded multiport transceivers.
FCS Errors	A count of frames received on a particular interface that are not an integral number of octets in length and do not pass the FCS check. FCS or Alignment Errors indicate bit errors during a transmission or reception.
Single Collisions	A count of successfully transmitted frames on a particular interface for which transmission is inhibited by exactly one collision.
Multiple Collisions	A count of successfully transmitted frames on a particular interface for which transmission is inhibited by more than one collision.
SQE Test Errors	A count of of times that the Signal Quality Error (SQE) TEST ERROR message is generated. The SQE Test is used to test for the collision present circuit between a transceiver and a network interface card (NIC).

Field	Description
Deferred Transmissions	A count of frames for which the first transmission attempt on a particular interface is delayed because the medium is busy.
Late Collisions	Number of times that a collision is detected later than 512 bit-times into the transmission of a packet
Excessive Collisions	Number of frames for which transmission fails due to excessive collisions
MAC Transmit Errors	A count of frames for which transmission on a particular interface fails due to an internal MAC sublayer transmit error. A faulty network transmitter can cause Internal MAC Transmit errors. Check the device to insure that it is functioning correctly.
Carrier Sense Errors	The number of times that the carrier sense condition was lost or never asserted when attempting to transmit a frame on a particular interface.
Frame Too Long	A count of frames received on a particular interface that exceed the maximum permitted framer size.
MAC Receive Errors	A count of frames for which reception on a particular interface fails due to an internal MAC sublayer receive error.

I/O Connections Page

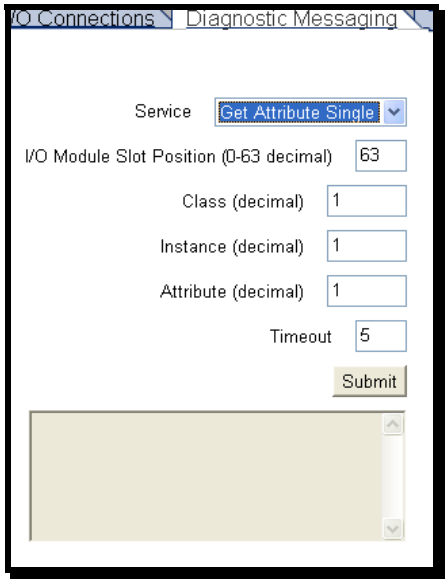
The **I/O CONNECTIONS** page opens when you expand the **DIAGNOSTICS** folder, and then click the **I/O CONNECTIONS** link on the left side of the page. Use this page to view detailed status information for the Input and Output modules connected to the ILX34-AENWG.



Column	Description
Conn# / Uptime	The connection assigned to this I/O connection and the amount of time that this connection has been up.
Rcv/Xmt	Receive and Transmit (Rcv/Xmt)
Conn. ID	Connection ID in hexidecimal
Source	Source IP Address with an indication of the following ▪ (O) for originator ▪ (T) for target
Dest	Destination IP Address
Multicast Addr.	Multicast Address
RPI	Requested Packet Interval (RPI)
Lost/Slot	Shows the number of lost packets and the slot number for the connection. A slot value of 0 indicates that this is a rack-optimized connection.
Size	Size of data in bytes

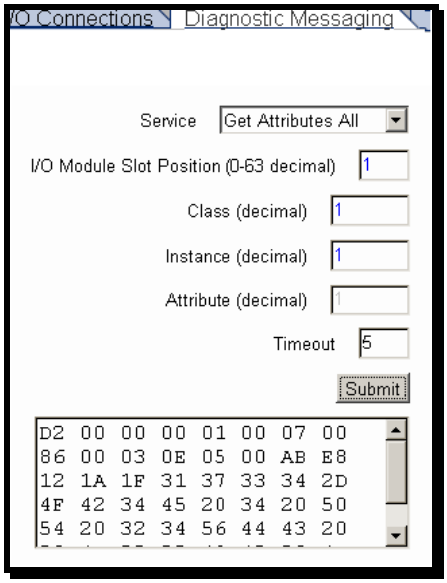
Diagnostic Messaging Page

The **DIAGNOSTIC MESSAGING** page opens when you expand the **DIAGNOSTICS** folder, and then click the **DIAGNOSTIC MESSAGING** link on the left side of the page. Use this page to execute explicit, unconnected message services (page 181).



Field	Description
Service	Get Attribute Single or Get Attributes All
I/O Module Slot Position	0 to 63 decimal
Class (decimal)	Refer to the documentation for each POINT I/O module for supported Class types
Instance (decimal)	Refer to the documentation for each POINT I/O module for supported Instance types
Attribute (decimal)	Refer to the documentation for each POINT I/O module for supported Attribute types
Timeout (seconds)	The number of seconds to wait for a response from the POINT I/O module

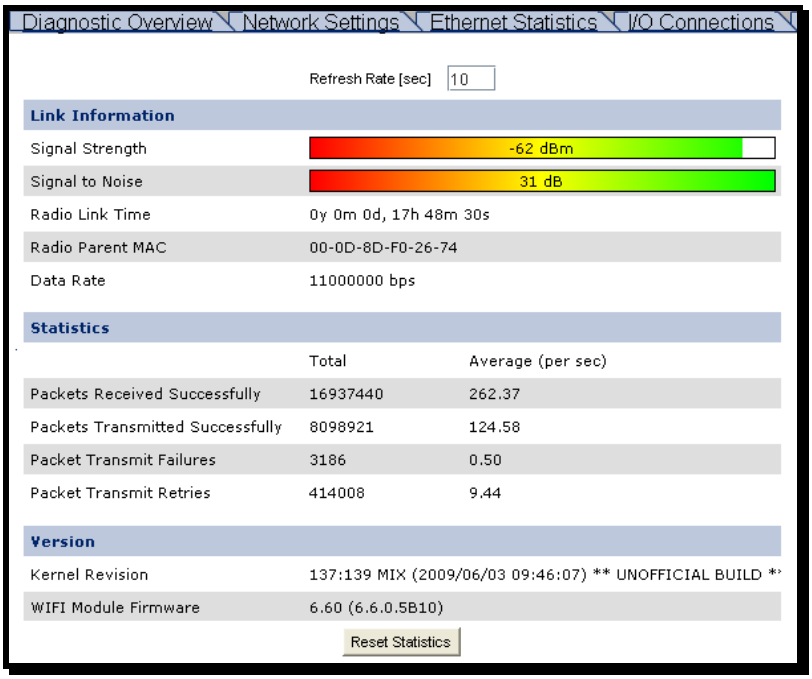
The following illustration shows the response to the CIP command "Get Attributes All", sent to the I/O module in Slot 1.



The data is returned in hexadecimal format. Refer to the documentation for each POINT I/O module (page 195) to determine the meaning of the response.

Wireless Statistics Page

The **WIRELESS STATISTICS** page opens when you expand the **DIAGNOSTICS** folder, and then click the **WIRELESS STATISTICS** link on the left side of the page. Use this page to view configuration and status information for the Wireless port on the ILX34-AENWG.



Link Information

Field	Description
Signal Strength	The colored graph indicates the signal level (page 95).
Signal to Noise	▪ < 0 , this is a BAD condition ▪ < 10, this is an OK condition ▪ > 10, this is a GOOD condition
Radio Link Time	The up-link time in days:hours:minutes:seconds. Note: This link status is checked at the Refresh rate, once every 10 seconds by default. If the link is down for less time than this, the up-time for the link will not get reset to 0.
Radio Parent MAC	The MAC address (hexadecimal) of the parent radio (access point)
Data Rate	Rf rate of the last packet received by the ILX34-AENWG. Although this field is informational, some packets, such as 802.11 management packets, will be at a rate that is lower than the data. In such an instance, the data could be going at a rate faster than this.

Statistics

Field	Description
Packets Received Successfully	Messages received with success. The average value gives a good indication of RF bandwidth consumption. The average should not exceed 1000 packets per second. If it does exceed this, the RPI should be decreased on the connections.

Field	Description
Packets Transmitted Successfully	Messages sent with success. The average value gives a good indication of RF bandwidth consumption. The average should not exceed 500 packets per second. f it does exceed this, the RPI should be decreased on the connections.
Packet Transmit Failures	Messages that have been retried 8 times and still were not transferred successfully. This number should not exceed 1% of the Packets Transmitted successfully.
Packet Transmit Retries	Messages sent requiring a retry. Retries of 20 to 50 per second are not uncommon. Retries of several hundred per second indicate the RF network is too busy or the RF link is poor.

Version

Field	Description
Kernel Revision	The internal software revision for the POINT I/O adapter
WIFI Module Firmware	The internal software revision for the wireless component of the POINT I/O adapter

Signal Strength Graph

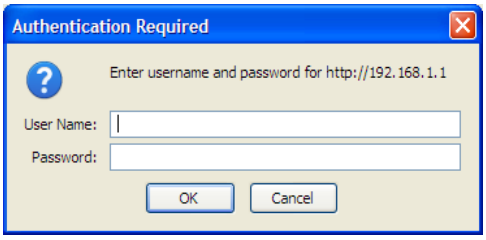
Image	Signal Strength	Signal to Noise
	-90 dBm	0 dB
	-88 dBm	2 dB
	-86 dBm	4 dB
	-84 dBm	6 dB
	-82 dBm	8 dB
	-80 dBm	10 dB
	-78 dBm	12 dB
	-76 dBm	14 dB
	-74 dBm	16 dB
	-72 dBm	18 dB
	-70 dBm	20 dB
	-68 dBm	22 dB
	-66 dBm	24 dB
	-64 dBm	26 dB
	-62 dBm	28 dB
	-60 dBm or greater	30 dB

4.1.2 Configuration Pages

The **CONFIGURATION** pages allows you to view and edit configuration information for your ILX34-AENWG I/O adapter and connected devices. Select the **CONFIGURATION** folder in the tree view on the left side of the page, and click **EXPAND** to view the menu, or click the tabs at the top of the page.

Important: The values on these pages are in non-volatile memory. Changes to these parameters do not take effect until you reset or cycle power to the ILX34-AENWG adapter.

Some of the configuration pages require you to provide a user name and password.

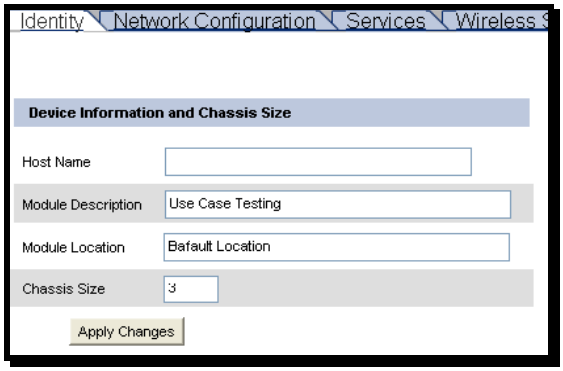


- The default user name is "admin".
- The default password is "password".
- The user name and password are case sensitive.

Identity Page

The **IDENTITY** page opens when you select the **CONFIGURATION** folder in the menu on the left side of the page, and then click the **IDENTITY** link. Use this page to view or modify the ILX34-AENWG adapter's name, location and chassis size.

Important: The values on this page are in non-volatile memory. Changes to these parameters do not take effect until you reset or cycle power to the ILX34-AENWG adapter.



Field	Description
Host Name	the name a Domain Name Server uses to resolve this adapter's IP address
Module Description	(Optional) Type a description for the ILX34-AENWG adapter. This can be useful to identify a specific ILX34-AENWG at sites where multiple adapters may be deployed.
Module Location	(Optional) Type a location for the ILX34-AENWG adapter. This can be useful to identify a specific ILX34-AENWG at sites where multiple adapters may be deployed.
Chassis Size	The number of POINT I/O modules plus the adapter. This value must match the number of I/O modules plus one for the adapter before any I/O connections are allowed (page 63).

Network Configuration Page

The **NETWORK** page opens when you select the **CONFIGURATION** folder in the menu on the left side of the page, and then click the **NETWORK** link. Use this page to view or modify the ILX34-AENWG adapter's TCP/IP and Ethernet port settings.

Important: The values on this page are in non-volatile memory. Changes to these parameters do not take effect until you reset or cycle power to the ILX34-AENWG adapter.

Initial Network Configuration

Field	Description
Ethernet Interface Configuration	Static - uses a fixed IP address Dynamic DHCP - obtains an IP address from a DHCP server

Network Interface

Field	Description
IP Address	The IP address identifies each node on the IP network (or system of connected networks). Each TCP/IP node on a network (including the Ethernet module) must have a unique IP address. This value must match the IP address entered on the General Tab of the Module Properties dialog box in RSLogix 5000.
Subnet Mask	Subnet addressing is an extension of the IP address scheme that lets a site use a single net ID for multiple physical networks. Routing outside of the site continues by dividing the IP address into a net ID and a host ID via the class. Inside a site, the subnet mask is used to redivide the IP address into a custom net ID portion and host ID portion. This field is set to 0.0.0.0 by default.
Gateway Address	A gateway connects individual physical networks into a system of networks. When a node needs to communicate with a node on another network, a gateway transfers the data between the two networks. The following figure shows gateway G connecting Network 1 with Network 2.
Primary Name Server	Enter the IP address of the primary DNS server to use for resolving (or translating) names to IP addresses
Secondary Name Server	Enter the IP address of the secondary DNS server to use for resolving (or translating) names to IP addresses
Domain Name	Domain (or domain zone) of which the ILX34-AENWG is a part. This value is used during name resolutions if a fully qualified name is not provided, and also for DNS updates.

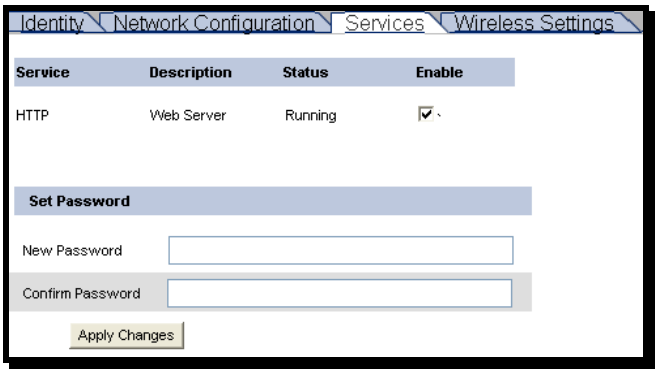
Ethernet Link Port 1 / 2

Field	Description
Port x Enable	Enable or Disable
Autonegotiate Status	Autonegotiate Speed and Duplex - determine speed and duplex by negotiating with connected devices Force Speed and Duplex - specify speed and duplex, setting must match configuration for other connected devices
Select Port Speed	10 megabits, 100 megabits
Select Duplex Mode	Half Duplex, Full Duplex

Services Page

The **SERVICES** page opens when you select the **CONFIGURATION** folder in the menu on the left side of the page, and then click the **SERVICES** link. Use this page to disable the adaptor's web server, or to change the password.

Important: The values on this page are in non-volatile memory. Changes to these parameters do not take effect until you reset or cycle power to the ILX34-AENWG adapter.



Field	Description
Service	The network service type. Only "HTTP" is available for configuration on the ILX34-AENWG
Description	The network service description. Only "Web Server" is available for configuration on the ILX34-AENWG
Status	Running or Disabled
Enable	Select (check) to enable the web server. Deselect (uncheck) to disable the web server. Changes will take effect the next time the module is reset. To re-enable the web server, reset the factory network parameters as described in Restoring the Factory Default Network Settings (page 114).

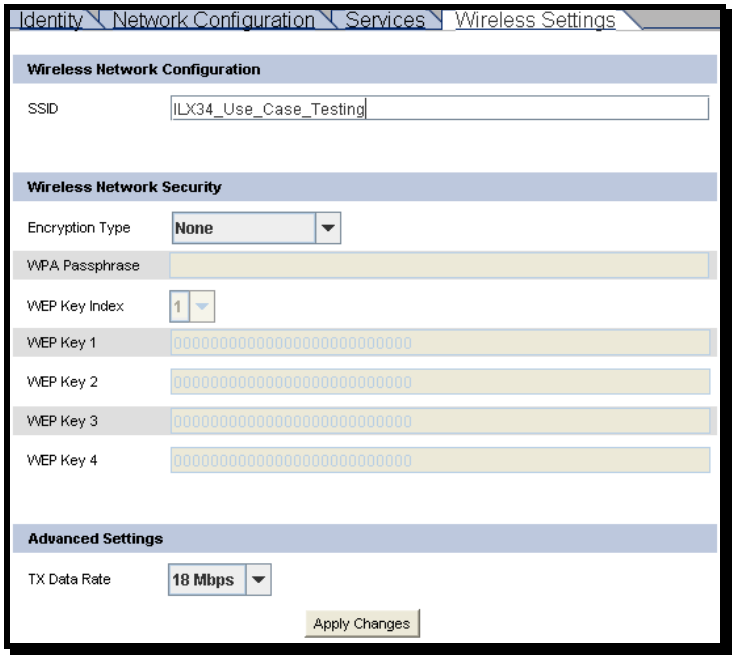
Set Password

Field	Description
New Password	To change the password, type the new password into this field, and then type it again in the "Confirm Password" field. ▪ The password is CaSe SeNsItIvE. ▪ The default password is the word "password".
Confirm Password	

Wireless Settings Page

The **WIRELESS SETTINGS** page opens when you select the **CONFIGURATION** folder in the menu on the left side of the page, and then click the **WIRELESS SETTINGS** link. Use this page to configure the radio settings for the adapter.

Important: The values on this page are in non-volatile memory. Changes to these parameters do not take effect until you reset or cycle power to the ILX34-AENWG adapter.

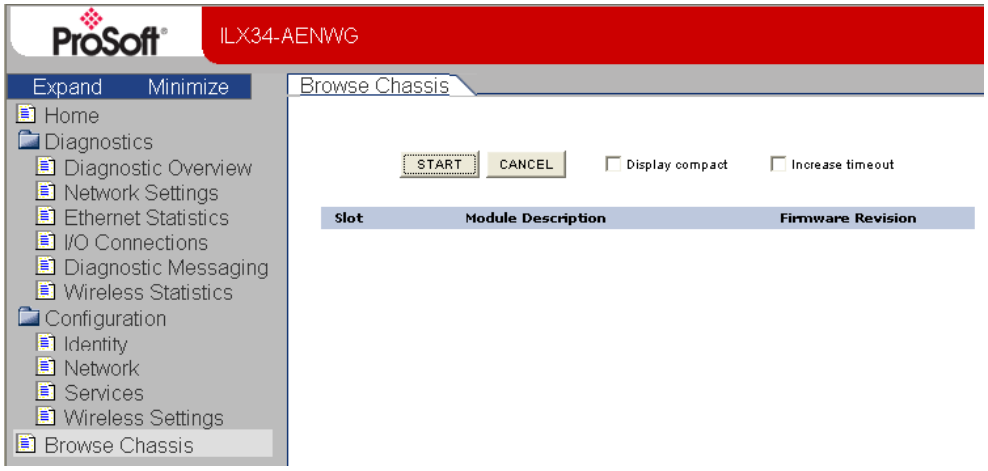


Field	Description
SSID	Assign a network name (SSID) of up to 32 characters. The radio uses this name in all network references. All radios in a network must have the same SSID. SSID names are case-sensitive.
Encryption Type	Choose the method by which the adapter will apply encryption security: ▪ NONE (not recommended) ▪ WEP128 - Legacy security setting using a 128-bit key and WEP encryption. ▪ WPA2/AES (Preferred) - Security setting using WPA (pre-shared key) authentication and AES encryption. The preferred encryption type is AES (Advanced Encryption Standard). You should only select WEP (wired equivalency protocol) for use with an older client radio that only has WEP encryption. WEP is the original security protocol used by 802.11 networks, but AES offers better protection against attacks, for several reasons: AES uses an advanced encryption algorithm that is not susceptible to the same weaknesses as WEP, it performs dynamic key management by changing the session keys frequently, and it performs message integrity checks to prevent forgery and replay. You can also select WEP 128, or None (no encryption) as the encryption type, but none of these settings are recommended.
WPA Passphrase	To use WPA2/AES encryption on packets sent between the radios, enter a WPA2/AES pass phrase of between eight and 63 normal keyboard characters. This phrase automatically generates an encryption key of 128 hexadecimal characters. This field is only available if you select WPA2/AES as the encryption type.
WEP Key Index	If using WEP128 encryption, select the Key Index that matches the Key Index used in the Access Point.
WEP Keys (1-4)	If using WEP128 encryption, enter the WEP Keys that match the Keys in the Access Point.
Transmit Data Rate	The recommended The ILX34-AENWG supports the following transmit data rates. The default value is Auto: Max 54 Mbps, and this is the recommended value for most applications. 1 Mbps — Auto: Max. 1 Mbps 2 Mbps — Auto: Max. 2 Mbps 5.5 Mbps — Auto: Max. 5.5 Mbps 11 Mbps — Auto: Max. 11 Mbps 18 Mbps — Auto: Max. 18 Mbps 24 Mbps — Auto: Max. 24 Mbps 36 Mbps — Auto: Max. 36 Mbps 54 Mbps — Auto: Max. 54 Mbps

4.1.3 Browse Chassis Page

The **BROWSE CHASSIS** page opens when you click the **BROWSE CHASSIS** link on the left side of the page. Use this page to retrieve a list of modules communicating with the ILX34-AENWG adapter.

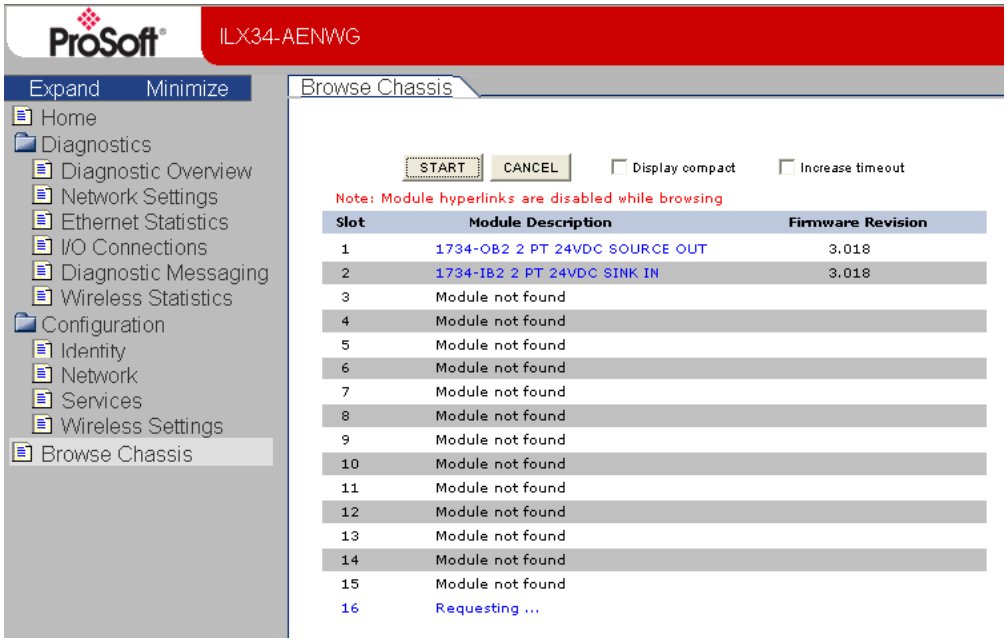
Click the **START** button to begin browsing. The ILX34-AENWG will query slots 1 through 63. Click **CANCEL** to stop browsing when the list is populated with the total number of modules installed in the system.



Tip: Select (check) the **INCREASE TIMEOUT** check box to give modules more time to respond to the query. This selection is useful when browsing a busy system.
Tip: Select (check) the **DISPLAY COMPACT** check box to reduce the font size and limit scrolling for systems with a large number of modules.

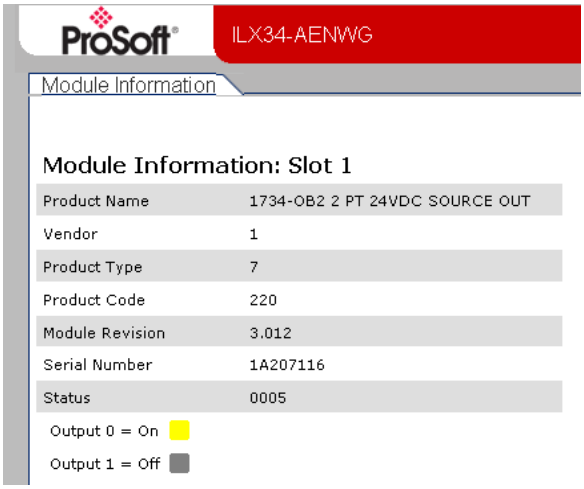
When a module is located, the Browse Chassis page adds it to the list. The list includes

- Slot number
- Module Description
- Firmware Revision

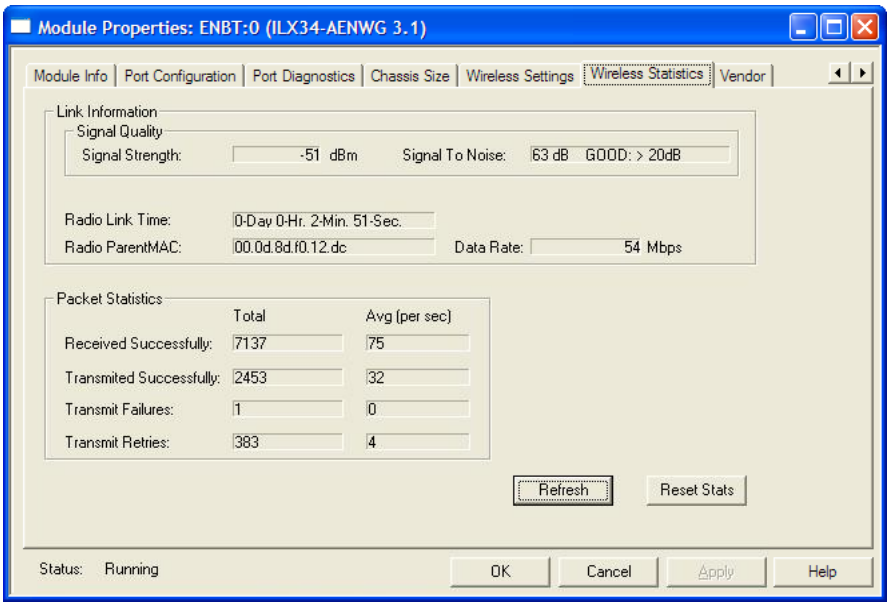


The **MODULE DESCRIPTION** field is a hyperlink. Click the link to view information about the module.

Note: The information on the **MODULE INFORMATION** page depends on the type and configuration of the module.



4.2 Viewing Wireless Statistics in RSLogix 5000



Field	Description
Signal Strength	
Signal to Noise	▪ < 0 , this is a BAD condition ▪ < 10, this is an OK condition ▪ > 10, this is a GOOD condition
Radio Link Time	The up-link time in days:hours:minutes:seconds
Radio parent MAC	The MAC address (hexadecimal) of the parent radio (access point)
Data Rate	In Mbps
Received Successfully	Messages received with success
Transmitted Successfully	Messages sent with success
Transmit Failures	Message sent and failed
Transmit Retries	Messages sent requiring a retry.

4.2.1 Sources of Interference

While the ILX34-AENWG operates reliably in industrial environments, interference (radio "noise") may still occur. Radios are designed to detect specific radio frequencies. An "interferer" is an unwanted signal that has been transmitted at the same frequency that the radio was designed to detect.

By far, the most common source of interference is from other 802.11 networks. Since I/O messaging is latency dependent, its important that other 802.11 networks do not interfere with the I/O network. It is recommended that the network use a channel free of interference from other 802.11 devices.

There are many man-made and natural sources of electromagnetic interference (lightning, power lines, switching power supplies, fluorescent lighting, microwave ovens, cordless phones, and so on). To decrease the effects of interference on network function:

- Use a directional (high gain) antenna at the Remote radio locations, if possible
- Verify that each network operating in close proximity to each other has BEEN ASSIGNED TO A DIFFERENT CHANNEL
- Install networks in rural areas (if at all possible) where they will likely encounter less man-made noise than in urban or suburban areas
- Enable encryption

Improving Signal Quality

If you need to improve a radio's signal quality, try the following steps:

- Adjust the direction of the high-gain antennas.
- Increase the height of the antenna's placement.
- Use higher-gain antennas or external preamplifiers.
- Select a new location for the radio and/or its antenna.
- Decrease the length of the antenna cable.
- Determine and resolve sources of interfering electrical noise.
- Add a repeater between radios that are not communicating.

4.3 Establish I/O Connections

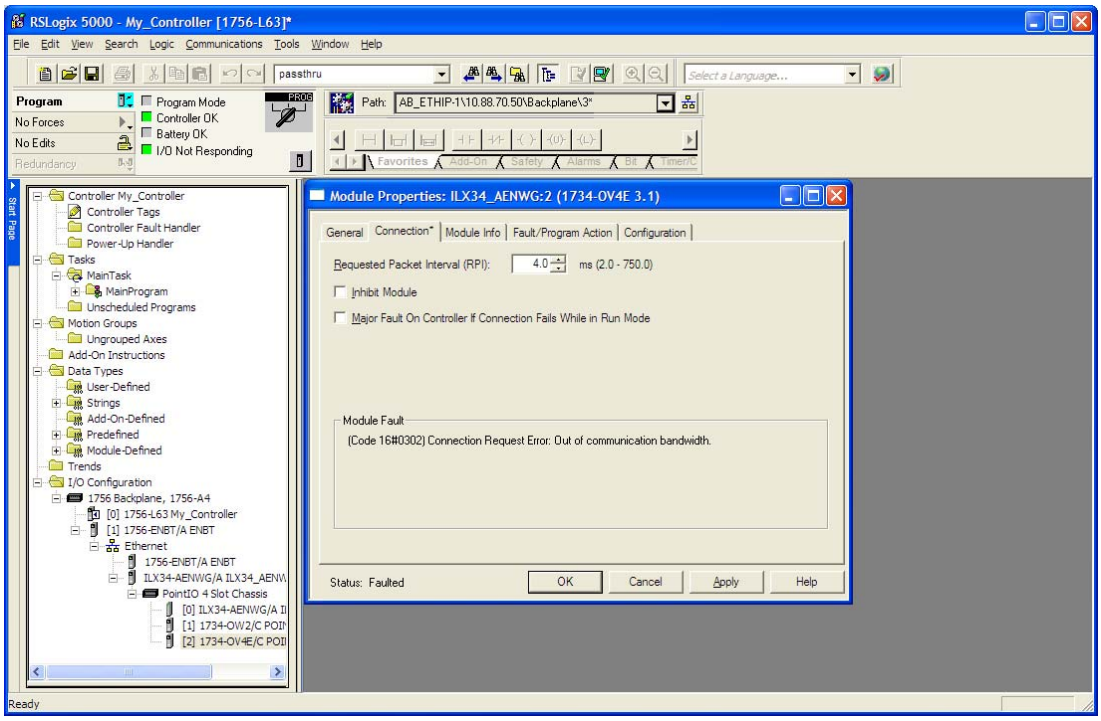
When you apply power to a POINT I/O system and establish I/O connections, the outputs transition to the Idle state, applying Idle state data before going to RUN mode. This occurs even when the controller making the connection is already in RUN mode.

4.4 Recover From an Overloaded Adapter

Each POINT I/O connection established with the ILX34-AENWG adapter consumes a portion of the microprocessor's bandwidth. The amount of bandwidth used by a connection depends on a number of variables, including the requested packet interval (RPI), the number of POINT I/O modules involved in the connection, and the rate of change of the I/O.

The ILX34-AENWG adapter continuously monitors this bandwidth and rejects requests for new connections when there is insufficient bandwidth available to support the new connection.

The condition where the ILX34-AENWG adapter cannot support the connection due to a limit of the microprocessor's bandwidth is shown in the following dialog.



If you encounter this condition, the only action you can take is to alter the existing connections to reduce the amount of microprocessor bandwidth consumed. The most likely fixes for this condition include the following.

- Increase the RPI.
- Decrease the number of connections.

4.5 Empty Slots and RIUP Situations

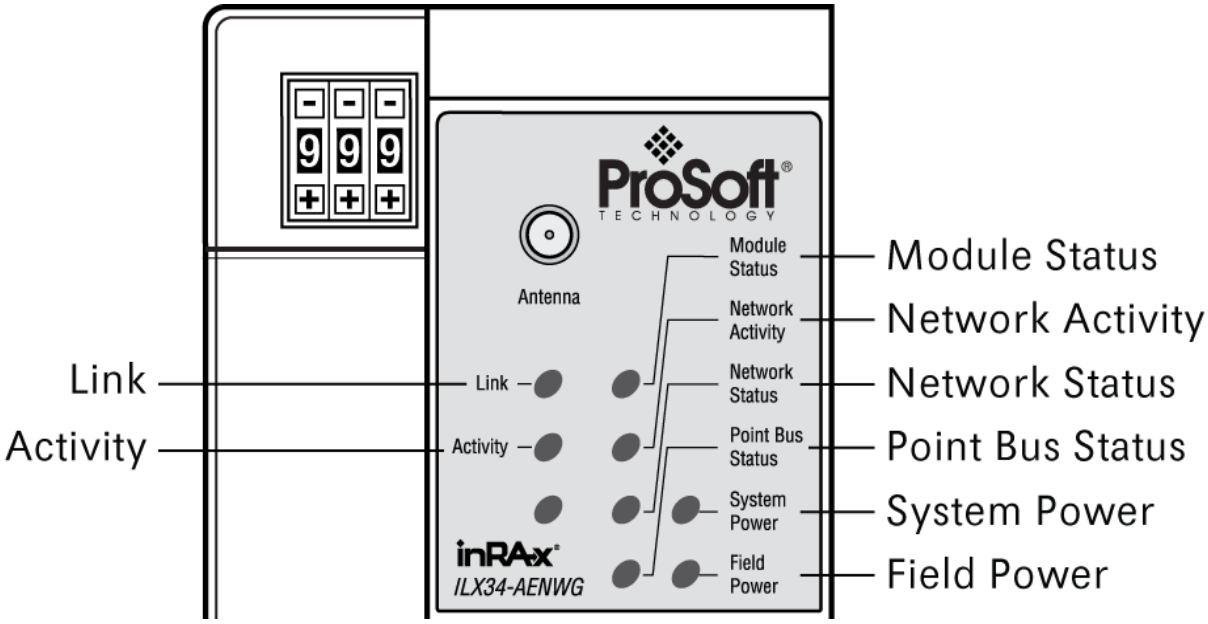
The POINT I/O system does not have the ability to detect an empty terminal base. Because of this, there are numerous situations in which you can potentially configure a system that is unusable or one that exercises unintended control.

In an attempt to address these situations, you must observe the following rules for POINT I/O system construction and the removal and reinsertion of modules.

- A correct POINT I/O system does not have any empty terminal bases.
- After you cycle power, the adapter will not run any I/O until the number of modules comprising the chassis equals the stored chassis size.
  - Because the adapter cannot detect empty terminal bases, it cannot assume any safe operation until there is a match between the number of modules indicating their presence in the chassis and what the adapter has saved in non-volatile memory.
  - Actual module identification (such as, electronic keying) is done when connection establishment requests are received from the controller or controllers.
- A module removed under power does not disrupt operation of the other I/O modules.
  - When you remove a module, the adapter determines what changed.
  - Whenever you remove a module with an active connection from the POINT I/O system, the adapter indicates this by flashing the POINTBus Status LED red and reports a minor recoverable fault.
- If more than one contiguous module is removed under power, connections to all modules in the contiguous missing module set are disallowed until all modules are replaced. Because the adapter cannot detect an empty base, it does not know the physical positioning of the modules until all the missing modules are replaced.
- If a module separating two sets of contiguous missing modules is removed, the two sets merge into a single set. All the modules must be replaced before connections are permitted to any module in the set.
- If modules of different types are removed and returned to the wrong locations, attempts to connect to these modules will fail during verification of the electronic ID (providing that keying has not been disabled).
- If modules of the same type are removed and returned to the wrong locations, they accept connections from the controller or controllers and reconfigure with the correct data once they pass their electronic keying check.
- These removal and return situations exist whether the system is under power or not. If the system is under power, the situation arises immediately. If the system is not under power, the situation arises in the next power cycle.

4.6 LED Status Indicators

Attention: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.



4.6.1 Module Status

Indication	Probable Cause	Recommended Action
Off	No power applied to device	Apply power to the device.
Flashing Red/Green	LED cycle power test (module self-test) present.	None
Solid Green	Device is operating normally.	None
Flashing Red	Recoverable fault has occurred: Firmware (NVS) update present. Address switches changed.	 Complete firmware update. Verify address switches.
Solid Red	Unrecoverable fault has occurred: Self-test failure present (checksum failure, or ramtest failure at cycle power). Firmware fatal error present.	Replace adapter.

4.6.2 Network Activity

Indication	Probable Cause	Recommended Action
Off	No link established.	Verify network cabling, and correct, as needed.
Flashing Green/Off	Transmit or receive activity present.	None
Steady Green	Link established.	None

4.6.3 Network Status

Indication	Probable Cause	Recommended Action
Off	Device not initialized. The module does not have an IP address.	Apply power to device, verify IP address, and correct, as needed.
Flashing Green	No CIP connections present. Device has an IP address, but no CIP connections are established.	None
Solid Green	CIP connections present. Device online and has an IP address, and CIP connections are established.	None
Flashing Red	One or more CIP connections has timed-out.	Check for I/O module failure and controller operation, and correct, as needed.
Solid Red	Duplicate IP address detected.	Verify IP address setting and correct, as needed.
Flashing Red/Green	The module is performing a self-test (only occurs during cycle power test).	None

4.6.4 POINTBus Status

Indication	Probable Cause	Recommended Action
Off	Device not powered - check module status indicator.	Apply power to device.
Flashing Red/Green	LED cycle power test present.	None
Flashing Red	Recoverable fault occurred:	
	▪ At cycle power the number of expected modules does not equal the number of modules present	▪ Configure chassis size.
	▪ A module is missing	▪ Check for missing module and reinstall as needed.
	▪ Node fault (I/O connection timeout) occurred.	▪ Check for I/O module failure and correct as needed.
Solid Red	Unrecoverable fault occurred - the adapter is bus off.	1. Cycle power to device. 2. If condition persists, replace device.
Flashing Green	Firmware (NVS) update in progress.	None
Solid Green	Adapter online with connections established (normal operation, Run mode).	None

4.6.5 System Power

Indication	Probable Cause	Recommended Action
Off	Not active; field power is off or dc-dc converter problem present.	1. Verify power is on, and apply power if needed. 2. Verify backplane power not exceeded, and correct. 3. Replace ILX34-AENWG module.
Green	System power is on; dc-dc converter is active (5V).	None

4.6.6 Field Power

Indication	Probable Cause	Recommended Action
Off	Not active; field power is off.	Apply field power.
Green	Power is on; 24V is present.	None

4.6.7 Wireless Link

Indication	Probable Cause	Recommended Action
Off / Flashing Rapidly	No RF link exists	▪ Verify wireless settings match those of an available Access Point. ▪ Verify antenna installation.
On, flashing off once every 10 seconds	The encryption settings do not match the AP being associated to.	Verify encryption settings.
Yellow	RF link is established	None

4.6.8 Wireless Data

Indication	Probable Cause	Recommended Action
Off	No data being transferred.	None
Green	Data is being transferred	None

4.7 Check the Ethernet cable

If you connect a radio and the Ethernet LED does not light on the radio, you may have used the wrong cable type. In other words, you may have used a cross-over cable when you should have used a straight-through cable, or vice versa.

Use a straight-through cable when connecting the radio to an Ethernet hub or a 10/100 Base-T Ethernet switch. Straight-through cables are used in most cases.

Use a cross-over cable when connecting the Ethernet radio directly to any device that is NOT a switch or a hub (for example, a direct connection to a PC, PLC, or printer).

4.7.1 Cable Connections

Ethernet Cable Specifications

The recommended cable is category 5 or better. A category 5 cable has four twisted pairs of wire that are color-coded and cannot be swapped. The radio uses only two pairs. One pair uses pins 1 and 2, and the second pair uses pins 3 and 6.

- Use a straight-through cable when connecting the radio to an Ethernet hub or a 10/100 Base-T Ethernet switch. Straight-through cables are used in most cases.
- Use a cross-over cable when connecting the Ethernet radio directly to any device that is NOT a switch or a hub (for example, a direct connection to a PC, PLC, or printer).

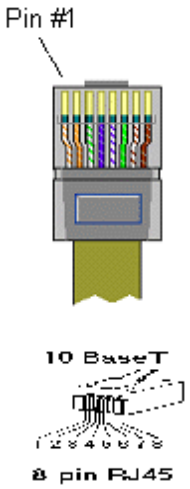
Ethernet cabling is like U.S. telephone cables, except that it has eight conductors. Some hubs have one input that can accept either a straight-through or crossover cable, depending on the switch position. In this case, you must ensure that the switch position and cable type agree.

Refer to Ethernet cable configuration (page 113) for a diagram of how to configure Ethernet cable.

Ethernet Cable Configuration

Note: The standard connector view shown is color-coded for a straight-through cable.

Crossover cable			Straight- through cable	
RJ-45 PIN	**RJ-45 PIN**		**RJ-45 PIN**	**RJ-45 PIN**
1 Rx+	3 Tx+		1 Rx+	1 Tx+
2 Rx-	6 Tx-		2 Rx-	2 Tx-
3 Tx+	1 Rx+		3 Tx+	3 Rx+
6 Tx-	2 Rx-		6 Tx-	6 Rx-



4.8 Restoring Factory Default Network Settings

Restoring the network settings to factory defaults depends on the version of firmware in your ILX34.

Firmware Versions 3.4.xxx

1. Turn module power off.
2. Change thumbwheels to 888.
3. Turn module power on.
4. Wait for at least one minute. During this one minute, the firmware will write default settings to the EEPROM that will take effect the next time module power is turned on.

   To ensure a one minute delay, open a command prompt window, enter:

```
ping localhost –n 60 && exit
```

   then wait until the command prompt window closes.

5. Observe the Point Bus Status LED. Initially it will be RED, then it will become GREEN, then it will turn off. Verify that it is not lit before disconnecting power.

WARNING: Do NOT remove power while the Point Bus Status LED is GREEN.

6. Change the thumbwheels to any value other than 888 or 777.
7. Turn module power on.

Firmware Version 3.5.0 and later

1. Turn module power off.
2. Change thumbwheels to 888.
3. Turn module power on.
4. The Point Bus Status LED will come on solid RED.

WARNING: Do NOT power off the ILX34 while the Point Bus Status LED is on.

5. After about 30 seconds, the Point Bus Status LED will go out. Once it does, you can power off the module safely.
6. Change the thumbwheels to any value other than 888 or 777.
7. Turn module power on.

NOTE: The Ethernet link is disabled when the thumbwheels are set to 888.

After a successful restart at the end of either procedure, if thumbwheels are set to a value from 001 to 254, then the number on the thumbwheels will become the last octet of the IP address, 192.168.1.XXX, where XXX is the value set on the thumbwheels. If the value on the thumbwheels are set to any number over 254 (except 888 and 777), then BOOTP is enabled and you can use a BOOTP utility to set the IP address.

After either of the above procedures, the following settings will be reset to these factory default settings:

- The DHCP Enabled function is enabled (set to **TRUE**).
- The Auto Negotiate functions of the Ethernet network and the wireless network are set to **TRUE**.
- The Web server is enabled.
- The password for this page resets to the factory default of "**PASSWORD**".

4.9 Restoring All Factory Default Settings

1. Turn module power off.
2. Change the thumbwheels to 777.
3. Turn module power on.
4. Run BOOTP and you will see a ProSoft MAC ID appear (00:0D:8D:XX:XX:XX). Use BOOTP to assign an IP address to the ILX34.
5. Open a web browser, and go to the IP address you just assigned (e.g. http://XXX.XXX.XXX.XXX).
6. Go to Configuration → Network → Network Configuration.
7. Select Disable for Ethernet Port 1. Click Apply Changes and wait for the change to be written, so it can become the active setting.
8. Select Enable for Ethernet Port 1. Click Apply Changes, and wait for the change to be written, so it can become the active setting.
9. Turn module power off.
10. Perform the reset procedure appropriate for your version of firmware. For details, see Restoring the Factory Default Network Settings (page 114).

WARNING: "Ethernet Port 1" is the wireless port. If you disable Ethernet Port 2 you will lose your wired connection to the ILX34.

4.10 Installing a Replacement Wireless POINT I/O Adapter to an Existing System

Important: During a connection request from the controller, the chassis size setting for a ILX34-AENWG adapter is not communicated to the adapter. You must always set this chassis size using a separate operation (page 63). This includes situations when you are replacing an adapter. The adapter does not make any I/O connections until it is configured with the appropriate chassis size.
Attention: You must use Series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules do not work with this adapter.

1. Remove the existing adapter from the DIN rail as follows:
   a) Disconnect the EtherNet connector from the adapter.
   b) Pull up on the RTB removal handle to remove the terminal block.
   c) Remove the adjacent module from its base.
   d) Use a small bladed screwdriver to rotate the DIN rail locking screw to a vertical position. This releases the locking mechanism.
   e) Lift straight up to remove.
2. Slide the safety end cap up to remove. This exposes the backplane and power connections.
3. Position the replacement adapter vertically above the DIN rail. Make certain the DIN rail lock is in the horizontal position. Slide the adapter down, allowing the interlocking side pieces to engage the adjacent module.
4. Press firmly to seat the adapter on the DIN rail. The adapter locking mechanism will snap into place.
5. Set the node address on the node address thumbwheel.
6. Insert the end of the terminal block (RTB) opposite the handle into the base unit. This end has a curved section that engages with the wiring base.
7. Rotate the terminal block into the wiring base until it locks itself into place.
8. Replace the adjacent module in its base.
9. Reconnect the Ethernet cable to the adapter.
10. Set the IP Address for this module. Refer to the Setting the Network Address section of these instructions.

4.11 Upgrading to Firmware Version 3.5.0

4.11.1 Requirements

To do update the firmware on an ILX34, you need:

- The firmware release package, **ControlFLASHv305.zip.**
- An Ethernet cable and network connection from your ILX34 to your PC.
- A PC running 32-bit Windows XP.

Note: Windows XP virtual machine environments and other Windows versions (e.g. Vista, Windows 7) will not work.

If your PC currently has any version of **ControlFLASH** installed, click on the **ControlFLASH.msi** file provided with the firmware release and proceed to the section, *Flash Programming the ILX34*.

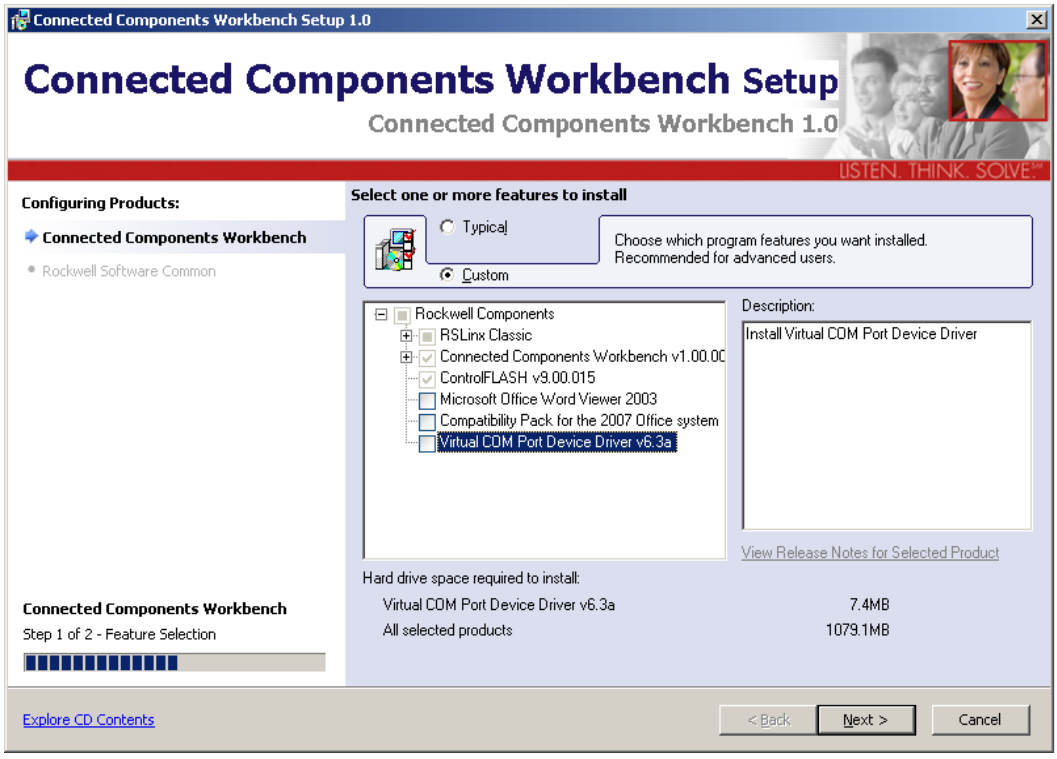
If your PC does not have **ControlFLASH** installed, you can download the software from Rockwell Automation Web site using the following link:

http://ab.rockwellautomation.com/Programmable-Controllers/Connected-Components-Workbench-Software

You will need to setup a free account to gain access.

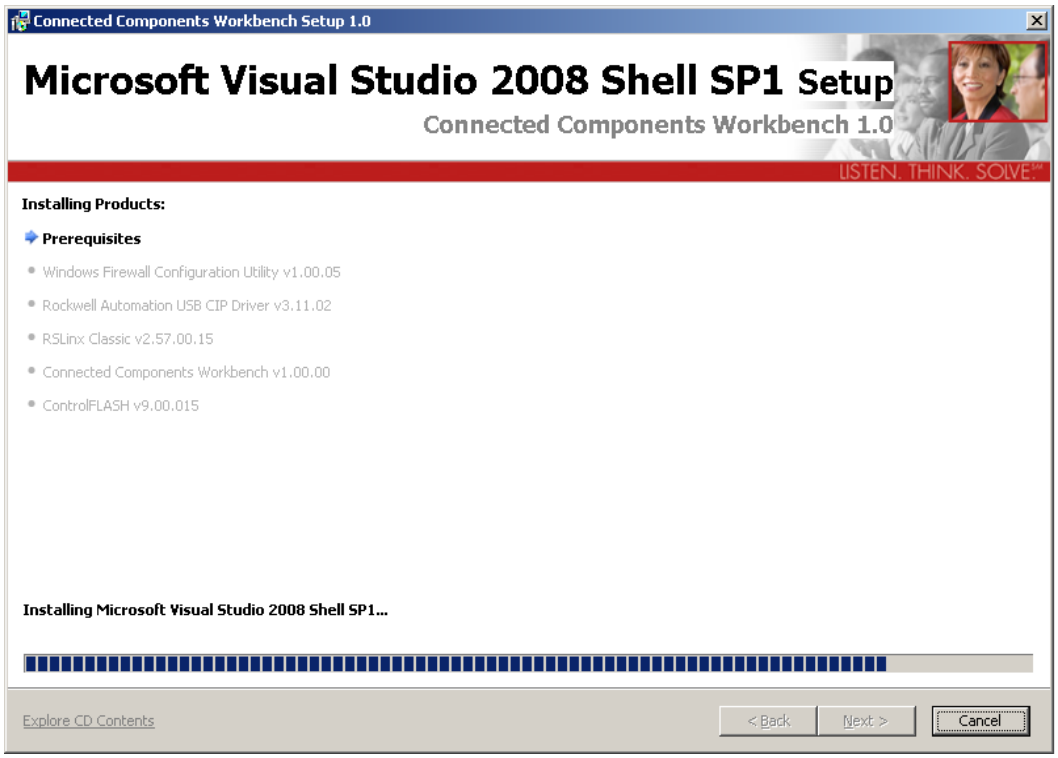
4.11.2 Installing the Connected Components Workshop package

1. Expand the **Connected Components Workshop** zip file.
2. After expansion, go to the System folder, then the **ControlFLASH** folder. Rename **ControlFLASH** to something else (e.g. **XControlFLASH**). This will prevent installation of an obsolete version of **ControlFLASH** that will interfere with a newer version we will install later.
3. Run **CCWSetup**, select your language, and click **CONTINUE**. You should see a screen like this:

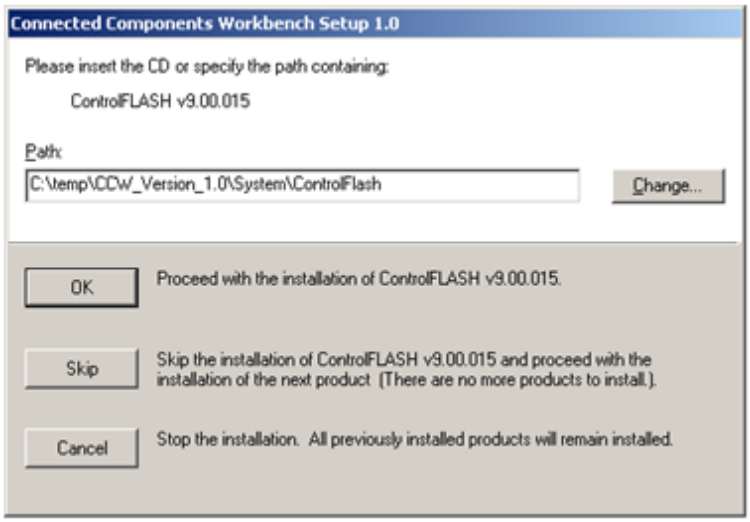

Connected Components Workbench Setup 1.0
Connected Components Workbench Setup
Connected Components Workbench 1.0
LISTEN. THINK. SOLVE.
Configuring Products:
Connected Components Workbench
Rockwell Software Common
Select one or more features to install
Typical
Custom
Choose which program features you want installed. Recommended for advanced users.
Rockwell Components
RSLinx Classic
Connected Components Workbench v1.00.00
ControlFLASH v9.00.015
Microsoft Office Word Viewer 2003
Compatibility Pack for the 2007 Office system
Virtual COM Port Device Driver v6.3a
Description:
Install Virtual COM Port Device Driver
View Release Notes for Selected Product
Hard drive space required to install:
Virtual COM Port Device Driver v6.3a 7.4MB
All selected products 1079.1MB
Connected Components Workbench
Step 1 of 2 - Feature Selection
Explore CD Contents
< Back
Next >
Cancel

4. Select the Custom radio button as shown above.
5. As shown above, deselect **Microsoft Office Word Viewer 2003**, **Compatibility Pack for the 2007 Office system**, and **Virtual COM Port Device Driver v6.3a**, then click **NEXT**.
6. In the following screen, enter your user name and company, then click **NEXT**.
7. Accept the license agreement in the next screen and click **NEXT.**

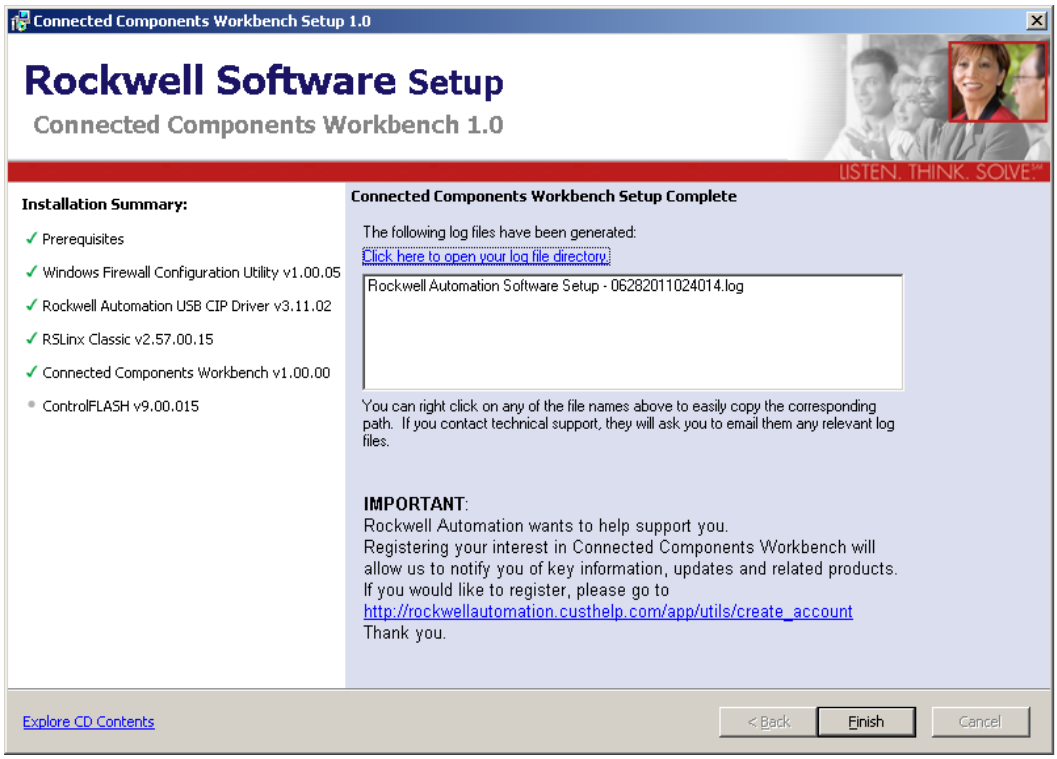
8 In the next screen, click Install. Installation will start and you will see some progress screens like the following:



9 When the system tries to install **ControlFLASH** v9.00.015, it will display this dialog:


Connected Components Workbench Setup 1.0
Please insert the CD or specify the path containing:
ControlFLASH v9.00.015
Path:
C:\temp\CCW_Version_1.0\System\ControlFlash
Change...
OK
Proceed with the installation of ControlFLASH v9.00.015.
Skip
Skip the installation of ControlFLASH v9.00.015 and proceed with the installation of the next product (There are no more products to install.).
Cancel
Stop the installation. All previously installed products will remain installed.

10 Click Skip. You should see something like this:

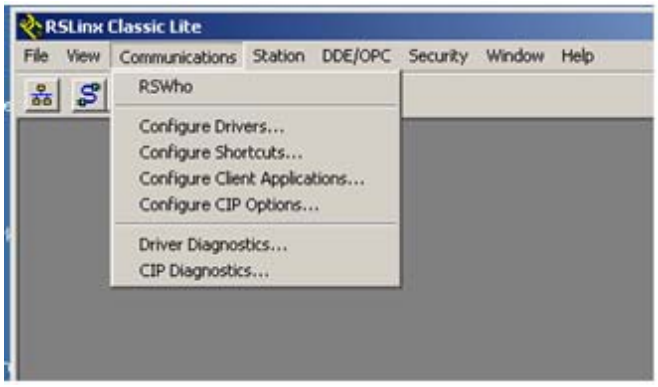

Connected Components Workbench Setup 1.0
Rockwell Software Setup
Connected Components Workbench 1.0
LISTEN. THINK. SOLVE.
Installation Summary:
✓ Prerequisites
✓ Windows Firewall Configuration Utility v1.00.05
✓ Rockwell Automation USB CIP Driver v3.11.02
✓ RSLinx Classic v2.57.00.15
✓ Connected Components Workbench v1.00.00
ControlFLASH v9.00.015
Connected Components Workbench Setup Complete
The following log files have been generated:
Click here to open your log file directory
Rockwell Automation Software Setup - 06282011024014.log
You can right click on any of the file names above to easily copy the corresponding path. If you contact technical support, they will ask you to email them any relevant log files.
IMPORTANT:
Rockwell Automation wants to help support you.
Registering your interest in Connected Components Workbench will allow us to notify you of key information, updates and related products.
If you would like to register, please go to
http://rockwellautomation.custhelp.com/app/utils/create_account
Thank you.
Explore CD Contents
< Back
Finish
Cancel

11 Click Finish to conclude the installation.

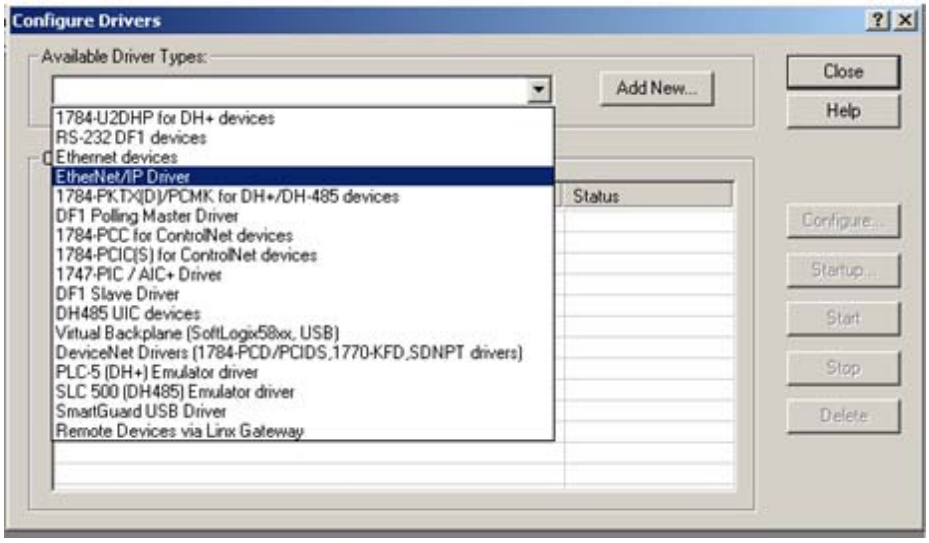
4.11.3 Configuring RSLinx

1 From your start menu, go to **START -> PROGRAMS -> ROCKWELL SOFTWARE -> RSLINX,** then run *RSLinx Classic*. You should see a new icon in your system tray like this:

2 Click on the *RSLinx Classic* tray icon, then click on **COMMUNICATIONS -> CONFIGURE DRIVERS...**

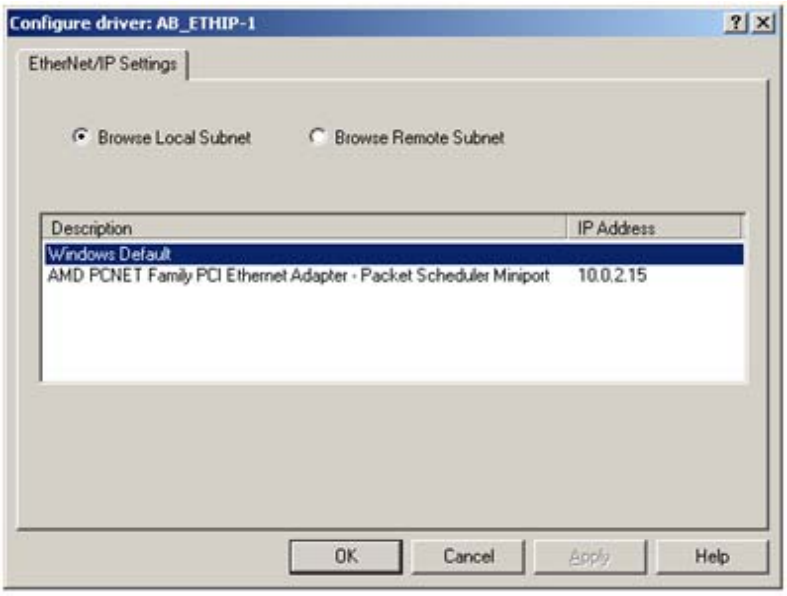


3 From the list of Available Driver Types, select **ETHERNET/IP DRIVER**, then click **ADD NEW ...**

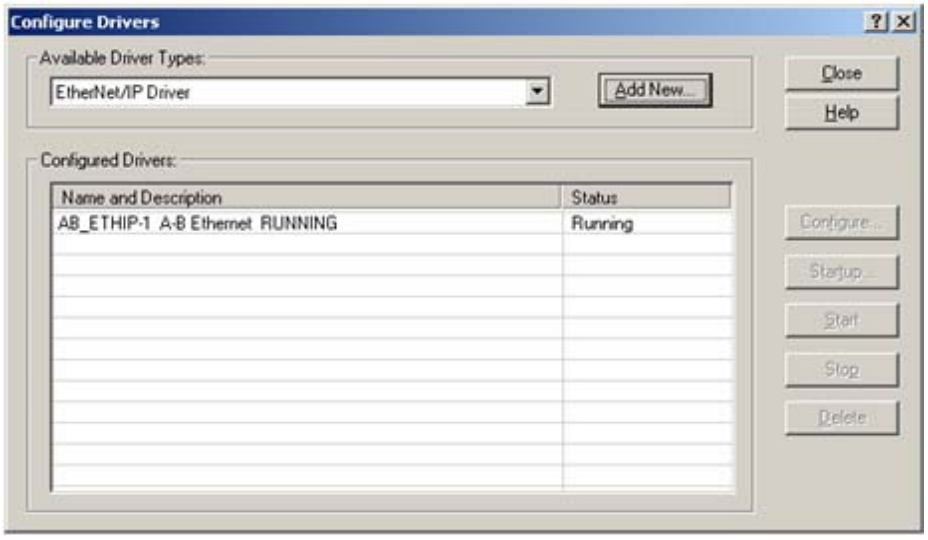


4 The following dialog will appear; click **OK**.

5 Next the following dialog will appear; click **OK**.



Finally you should see the following dialog.



6 Click **CLOSE** and exit *RSLinx Classic Lite*.

4.11.4 Installing the Firmware Package

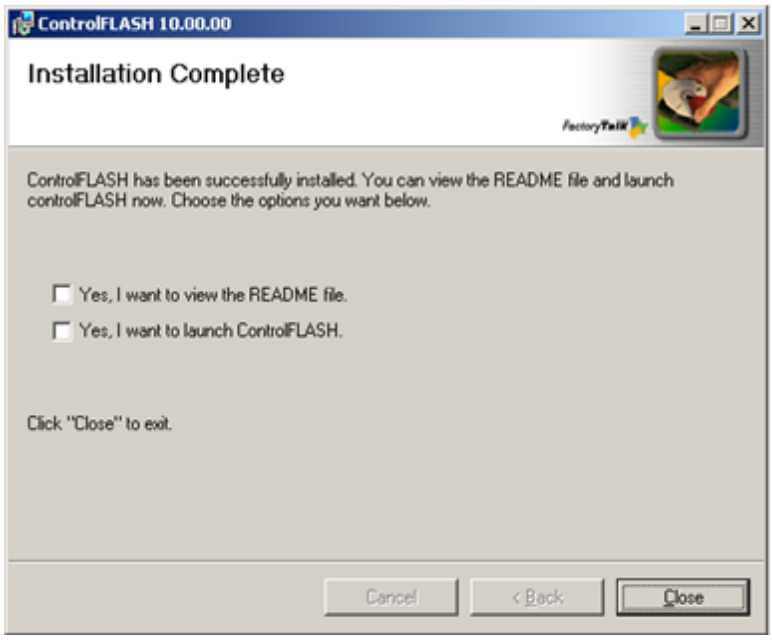
1 Click on **CONTROLFLASH.MSI**. You should see the following:

ControlFLASH 10.00.00
Welcome to the ControlFLASH 10.00.00 Setup Wizard
The installer will guide you through the steps required to install ControlFLASH on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
Cancel
< Back
Next >

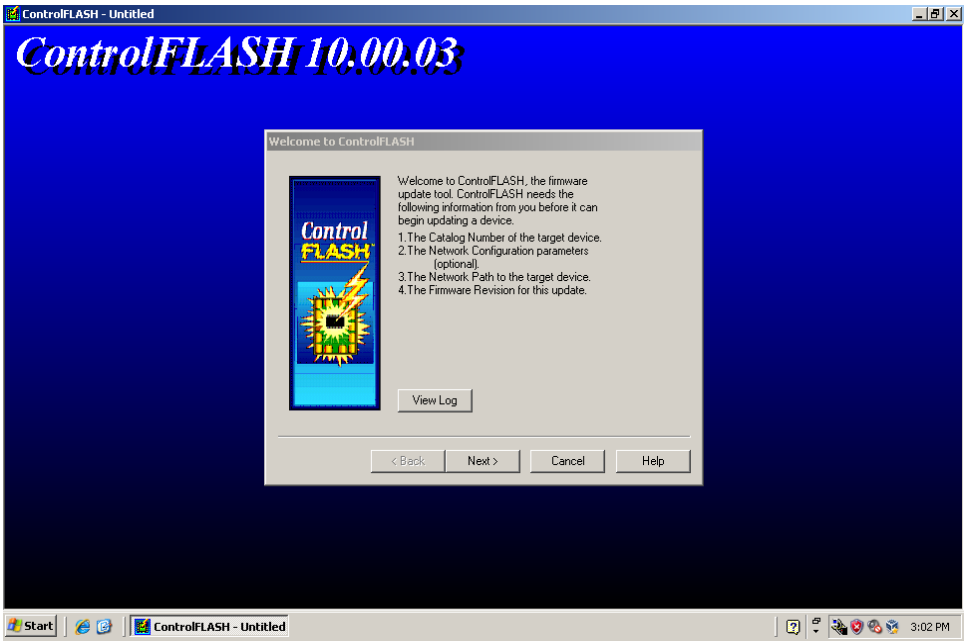
2 Click **NEXT**
3 Accept (Agree with) the license agreement in the next dialog, then click **NEXT**.
4 Click **NEXT** to install the application in the default location.
5 Click **NEXT** again to confirm installation.

4.11.5 Flash programming the ILX34

After installation you should see this dialog:

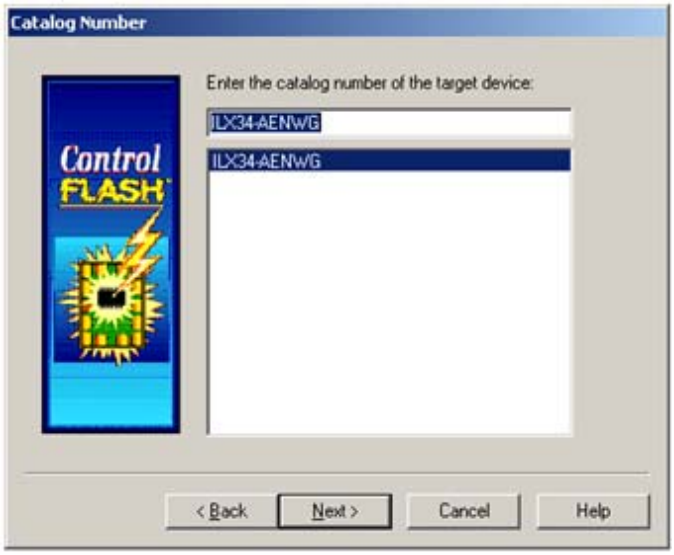

ControlFLASH 10.00.00
Installation Complete
ControlFLASH has been successfully installed. You can view the README file and launch controlFLASH now. Choose the options you want below.
Yes, I want to view the README file.
Yes, I want to launch ControlFLASH.
Click "Close" to exit.
Cancel
< Back
Close

1 Select **YES, I WANT TO LAUNCH CONTROLFLASH,** then click **CLOSE**. You should see something like the following:


ControlFLASH - Untitled
ControlFLASH 10.00.03
Welcome to ControlFLASH
Welcome to ControlFLASH, the firmware update tool. ControlFLASH needs the following information from you before it can begin updating a device.
1.The Catalog Number of the target device.
2.The Network Configuration parameters (optional)
3.The Network Path to the target device.
4.The Firmware Revision for this update.
View Log
< Back
Next >
Cancel
Help
Start
ControlFLASH - Untitled
3:02 PM

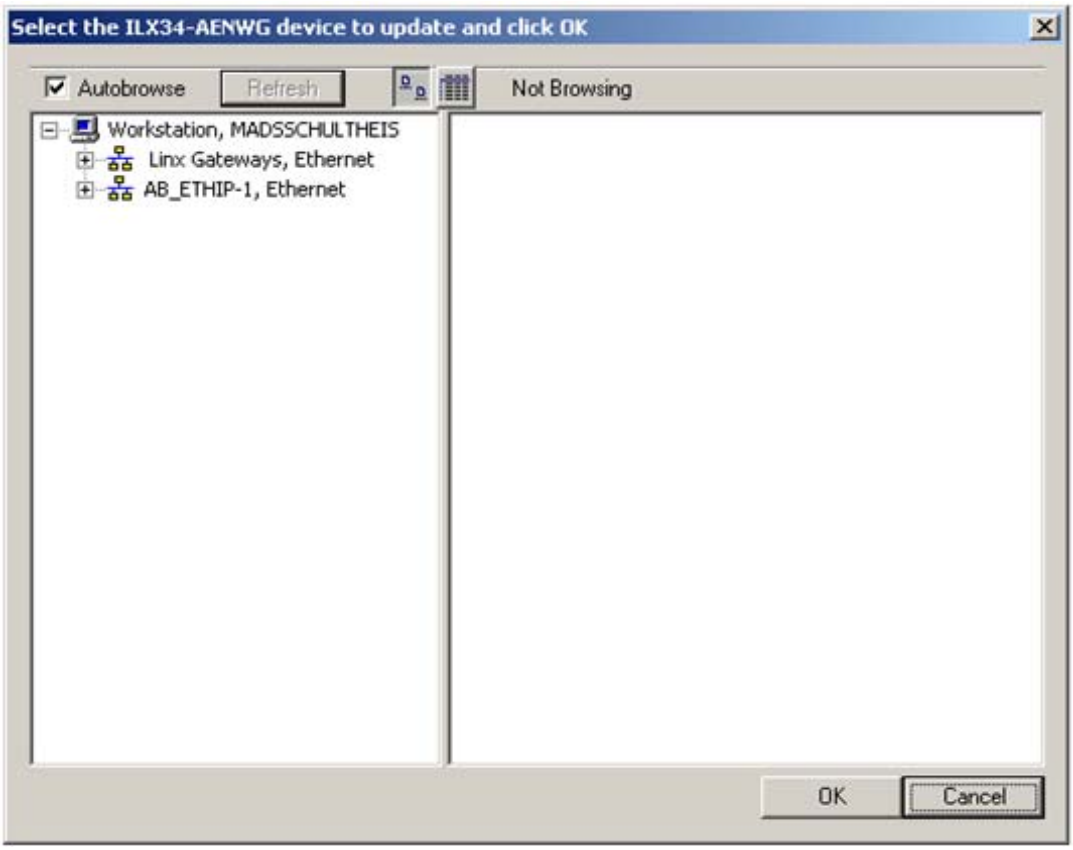
2 Click **NEXT>**

You will be presented with a dialog like the following. There may be additional *catalog numbers* listed for your system.



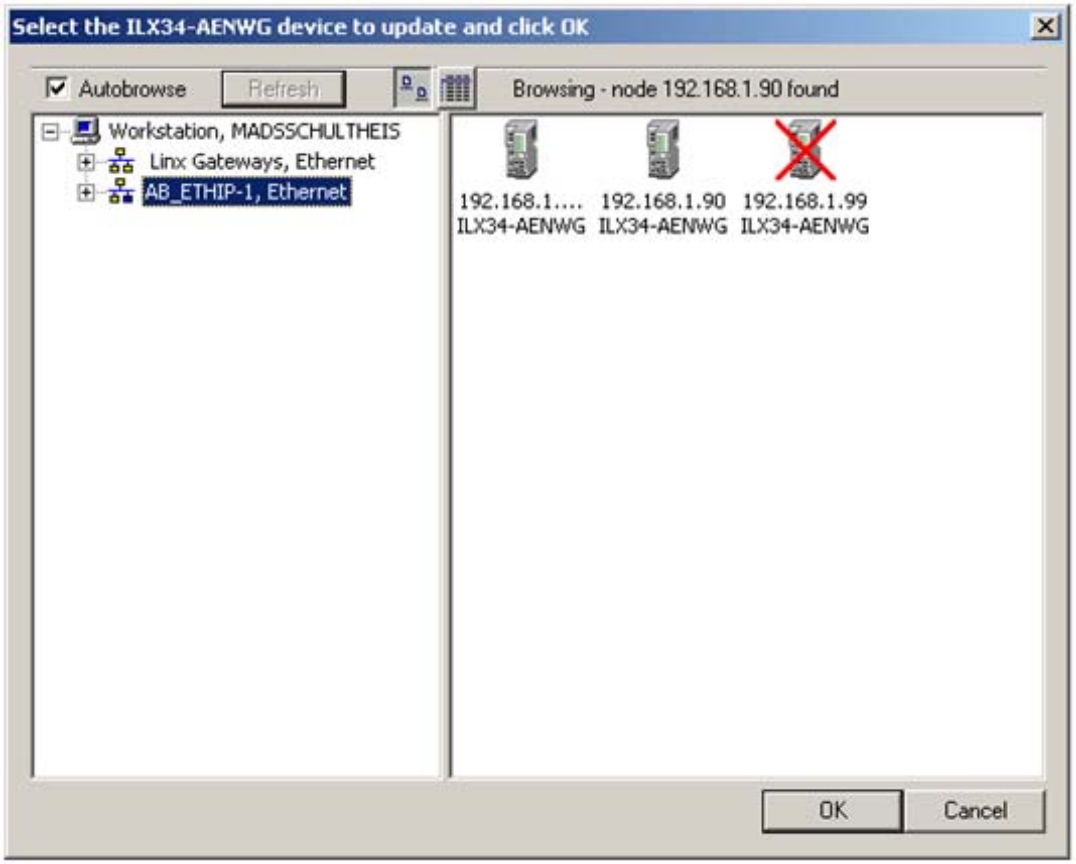
3 Select **ILX34-AENWG** and click **NEXT>**

You should see a dialog like the following:



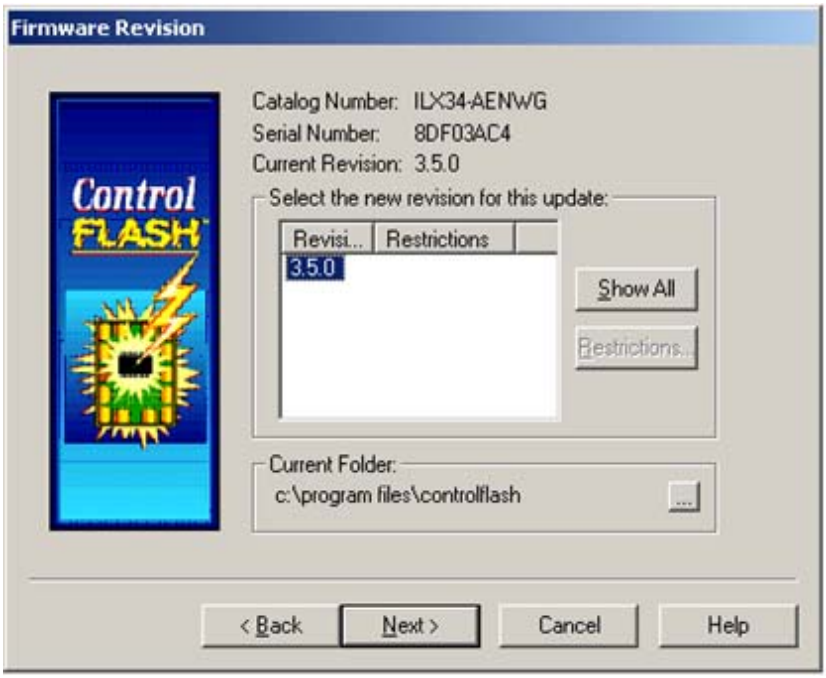
4 Click on **AB_ETHIP-1, ETHERNET** on the left pane.

You should see something like this:

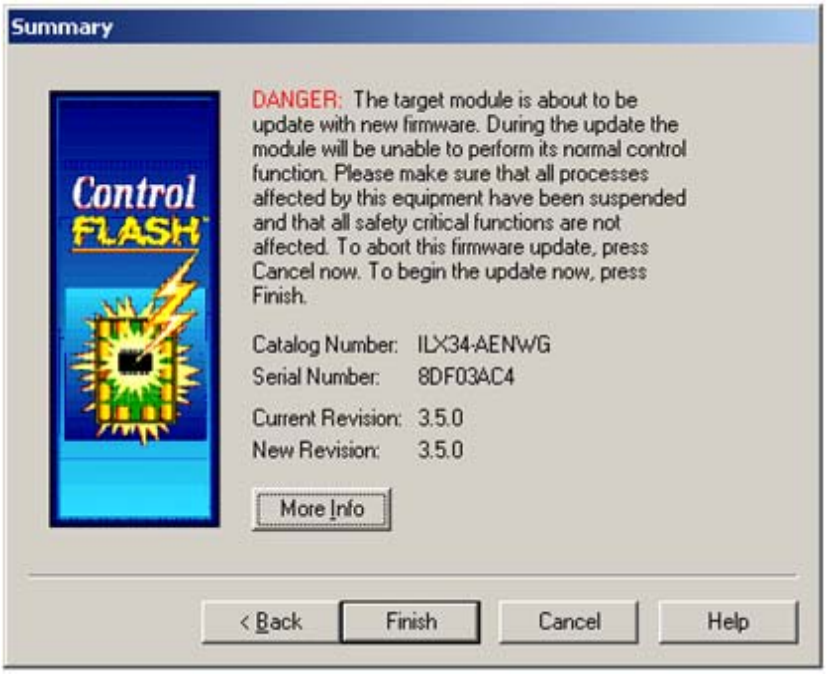


Any ILX34 devices detected will appear in the right pane as in the above example. For our example, we will flash the device shown at IP address 192.168.1.90. (Note that the device at 192.168.1.99 was detected in a previous ControlFLASH session, but it can be ignored.)

5 Click on the device to flash, then click **OK.** You will see something like this:

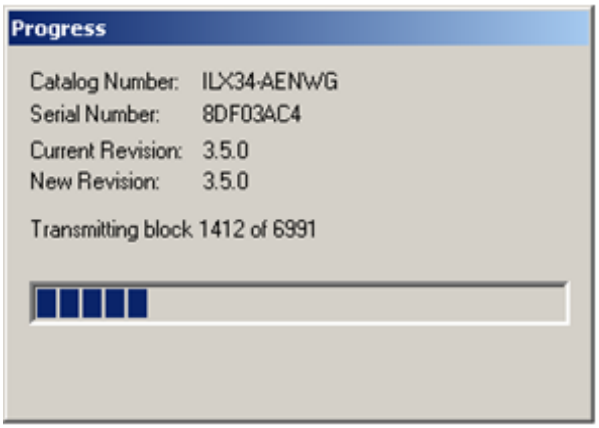


6 Select Revision **3.5.0,** which should be the only firmware version that appears, then click **NEXT>**. You will get something like:

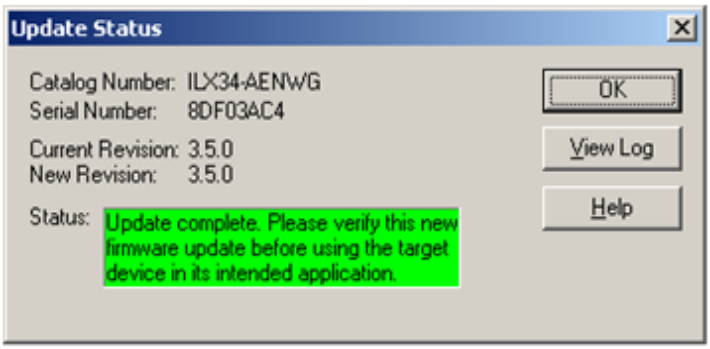

Summary
Control FLASH
DANGER: The target module is about to be update with new firmware. During the update the module will be unable to perform its normal control function. Please make sure that all processes affected by this equipment have been suspended and that all safety critical functions are not affected. To abort this firmware update, press Cancel now. To begin the update now, press Finish.
Catalog Number: ILX34-AENWG
Serial Number: 8DF03AC4
Current Revision: 3.5.0
New Revision: 3.5.0
More Info
< Back
Finish
Cancel
Help

7 Click **FINISH**, then **YES** to begin flash update programming the ILX34-AENWG.

Programming is done in four stages, with pauses between the stages. During programming, you will see progress indicators like this:



Upon successful completion you should see the following:

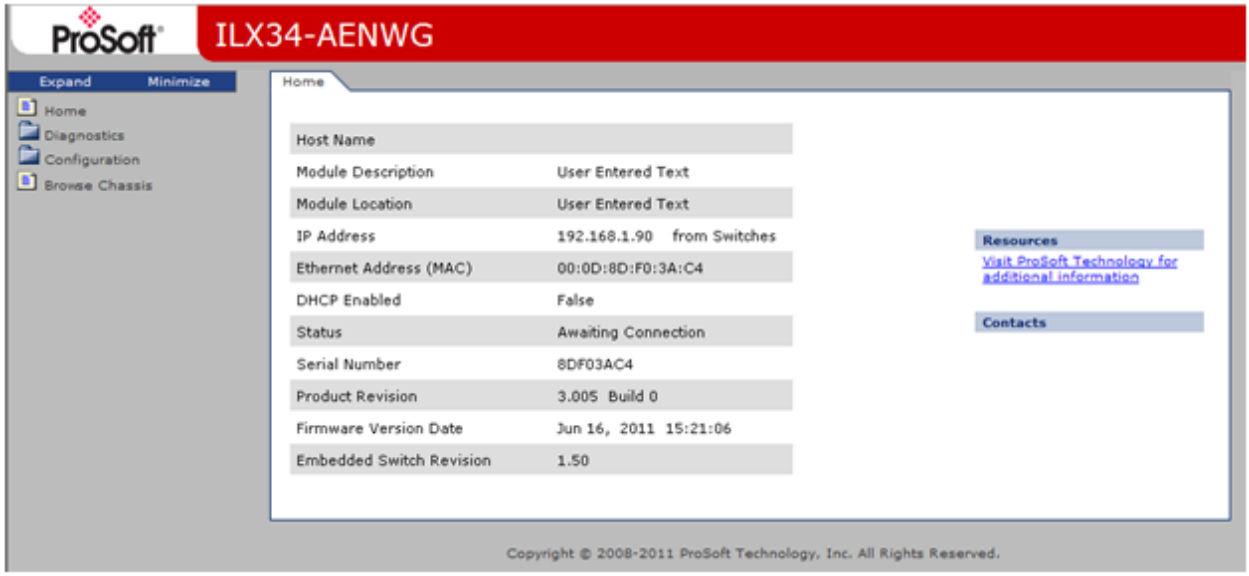

Update Status
Catalog Number: ILX34-AENWG
Serial Number: 8DF03AC4
Current Revision: 3.5.0
New Revision: 3.5.0
Status: Update complete. Please verify this new firmware update before using the target device in its intended application.
OK
View Log
Help

8 Click **OK**, then **CANCEL**, then **YES** to exit *ControlFLASH*.

4.11.6 Testing the new firmware installation

Turn off the power to your ILX34, wait a few seconds, then turn power on. Once the *Point Bus Status LED* is no longer solid RED, the unit should be operational with the new firmware.

To verify the new firmware version, open a web browser to the ILX34's IP address. You should see a screen like the following:



The important thing to notice is that the *Product Revision* is *3.005 Build 0*, which is the version of firmware that you just installed.

5 Ladder Logic

In This Chapter

- Adjusting the Input and Output Array Sizes (Optional) 131
- 1734 POINT I/O Module/RSLogix 5000 Controller Tag Reference 133

5.1 Adjusting the Input and Output Array Sizes (Optional)

The module internal database is divided into two user-configurable areas:

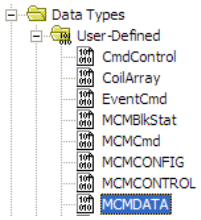
- Read Data
- Write Data.

The Read Data area is moved from the module to the processor, while the Write Data area is moved from the processor to the module. You can configure the start register and size of each area. The size of each area you configure must match the Add-On instruction controller tag array sizes for the **READDATA** and **WRITEDATA** arrays.

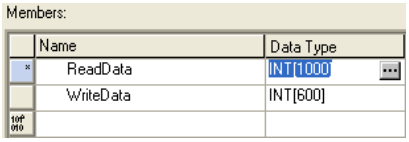
The ILX34-AENWG sample program is configured for 600 registers of **READDATA** and 600 registers of **WRITEDATA,** which is sufficient for most application. This topic describes how to configure user data for applications requiring more than 600 registers of ReadData and WriteData.

Important: Because the module pages data in blocks of 200 registers at a time, you must configure your user data in multiples of 200 registers.
Caution: When you change the array size, RSLogix may reset the AENWG tag values to zero. To avoid data loss, be sure to save your settings before continuing.

1 In the **CONTROLLER ORGANIZATION** window, expand the **DATA TYPES** and **USER-DEFINED** folders, and then double-click **AENWGDATA.** This action opens an edit window for the AENWGDATA data type.



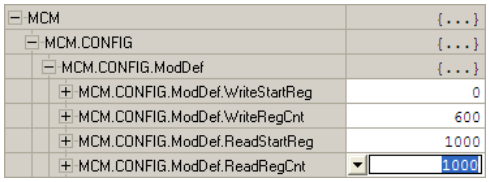
2 In the edit window, change the value of the **READDATA** array from **INT[600]** to **INT[1000]** as shown, and then click **APPLY.**



Note: If RSLogix resets your data values, refer to the backup copy of your program to re-enter your configuration parameters.

3 Next, navigate to **CONTROLLER TAGS** and double click to open an edit window. Click the **MONITOR TAGS** tab at the bottom of the edit window.

4 Click **[+]** to expand the **AENWG.CONFIG.MODDEF** section, and then change the **READREGCNT** parameter from 600 to 1000.



5 Save and download the sample program to the processor.

6 Go Online with the ControlLogix processor, and then toggle the **AENWG.CONTROL.WARMBOOT** bit to download the configuration to the ILX34-AENWG module.

Note: Any changes made to the AENWG.CONFIG or WriteData arrays must be downloaded to the ILX34-AENWG module. The use of the AENWG.CONTROL.WarmBoot or AENWG.CONTROL.ColdBoot bit will cause the ILX34-AENWG module to re- read the configuration from the ControlLogix processor.

To modify the **WRITEDATA** array, follow the steps in this topic, but substitute **WRITEDATA** for ReadData throughout. Also, make sure that the **READDATA** and **WRITEDATA** arrays do not overlap in the module memory. For example, if your application requires 2000 words of WriteData starting at register 0, then your **AENWG.CONFIG.MODDEF.READSTARTREG** must be set to a value of 2000 or greater.

5.2 1734 POINT I/O Module/RSLogix 5000 Controller Tag Reference

Attention: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

5.2.1 1734 POINT I/O Catalog Numbers

Digital Modules

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IA2/C	2 POINT 120V ac Input
1734-IB2/C	2 POINT 10V…28V dc Input, Sink
1734-IB4/C	4 POINT 10V…28V dc Input, Sink
1734-IM2/C	2 POINT 240V ac Input
1734-IV2/C	2 POINT 10V…28V dc Input, Source
1734-IV4/C	4 POINT 10V…28V dc Input, Source
1734-OA2/C	2 POINT 120V ac Output
1734-OB2E/C	2 POINT 10V…28V dc Electronically Fused Output, Source
1734-OB2EP/C	2 POINT 10V…28V dc Electronically Fused Protected Output, Source
1734-OB4E/C	4 POINT 10V…28V dc Electronically Fused Output, Source
1734-OV2E/C	2 POINT 10V…28V dc Electronically Fused Output, Sink
1734-OV4E/C	4 POINT 10V…28V dc Electronically Fused Output, Sink
1734-OW2/C	2 POINT ac/dc Relay Output
1734-OX2/C	2 POINT Relay Output N.O./N.C.

Analog Modules

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IE2C/C	2 Channel Analog Current Input
1734-IE2V/C	2 Channel Analog Voltage Input
1734-IR2/C	2 Channel RTD Input
1734-IT2I/C	2 Channel Thermocouple Input, Isolated
1734-OE2C/C	2 Channel Analog Current Output
1734-OE2V/C	2 Channel Analog Voltage Output

Specialty I/O

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-232ASC/C	1 Channel ASCII Interface Module
1734-IJ/C	1 Channel 5V dc Encoder/Counter
1734-IK/C	1 Channel 15…24V dc Encoder/Counter
1734-SSI/C	1 Channel Synchronous Serial Interface
1734-VHSC24/C	1 Channel 15…24V dc Very High-speed Counter
1734-VHSC5/C	1 Channel 5V dc Very High-speed Counter

Note: All POINT I/O modules must be **series C** or above for RSLogix 5000 software, version 11, compatibility.
The 1734-232ASC/A (series A) is presently the only exception to the series **C** requirement. With RSLogix 5000 software, version 11, use it as a generic 1734 module. With RSLogix 5000 software, version 12 or later, it is directly supported.

5.2.2 Valid Number Ranges for RSLogix 5000 Data Types

Type	Number	Range
BIT	1 Bit	0 or 1
SINT	8 Bit	-128…+127
INT	16 Bit	-32,768…32,767
DINT	32 Bit	-2,147,483,648…2,147,483,647

Accepted parameter values are dependent on POINT I/O module type and tag type.

5.2.3 Digital 2 POINT Input

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IA2	2 POINT 120V ac Input
1734-IB2	2 POINT 10V…28V dc Input, Sink
1734-IM2	2 POINT 240V ac Input
1734-IV2	2 POINT 10V…28V dc Input, Source

Configuration Data	Data Type	Default Value	Valid Data Values
Filter Off On Time - POINT 0	INT	1,000	-32,768…32,767 μs (see note) (0…65,535)
Filter On Off Time - POINT 0	INT	1,000	-32,768…32,767 μs (see note) (0…65,535)
Filter Off On Time - POINT 1	INT	1,000	-32,768…32,767 μs(see note) (0…65,535)
Filter On Off Time - POINT 1	INT	1,000	-32,768…32,767 μs(see note) (0…65,535)

Input Data	Data Type	Default Value	Valid Data Values
Input Data - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

Output Data	Data Type	Default Value	Valid Data Values
None			

Note: POINT I/O Modules support the Unsigned Integer data type UINT (0 to 65,535 range). RSLogix 5000 software supports the signed Integer data type INT (-32,768 to +32,767 range). To enter Filter values from +32,768 to +65,535 μs, use this conversion formula:
Desired Filter Value (in μs) - 65536 = Entered Filter Value (in μs).
Example: for a 40 ms filter time, 40000 - 65536 = -25536

5.2.4 Digital 4 POINT Input

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IB4	4 POINT 10…28V dc Input, Sink
1734-IV4	4 POINT 10…28V dc Input, Source

Configuration Data	Data Type	Default Value	Valid Data Values
Filter Off On Time - POINT 0	INT	1,000	-32,768…32,767 μs (see note) (0…65,535)
Filter On Off Time - POINT 0	INT	1,000	-32,768…32,767 μs (see note) (0…65,535)
Filter Off On Time - POINT 1	INT	1,000	-32,768…32,767 μs(see note) (0…65,535)
Filter On Off Time - POINT 1	INT	1,000	-32,768…32,767 μs (see note) (0…65,535)
Filter Off On Time - POINT 2	INT	1,000	-32,768…32,767 μs(see note) (0…65,535)
Filter On Off Time - POINT 2	INT	1,000	-32,768…32,767 μs(see note) (0…65,535)
Filter Off On Time - POINT 3	INT	1,000	-32,768…32,767 μs (see note) (0…65,535)
Filter On Off Time - POINT 3	INT	1,000	-32,768…32,767 μs (see note) (0… 65,535)

Input Data	Data Type	Default Value	Valid Data Values
Input Data - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On

Output Data	Data Type	Default Value	Valid Data Values
None			

Note: POINT I/O Modules support the Unsigned Integer data type UINT (0 to 65,535 range). RSLogix 5000 software supports the signed Integer data type INT (-32,768 to +32,767 range). To enter Filter values from +32,768 to +65,535 ms, use this conversion formula:
Desired Filter Value (in ms) - 65536 = Entered Filter Value (in ms).
Example: for a 40 ms filter time, 40000 - 65536 = -25536

5.2.5 Digital 2 POINT Output - Without Diagnostic Status

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OA2	2 POINT 120V ac Output
1734-OW2	2 POINT ac/dc Relay Output
1734-OX2	2 POINT Relay Output N.O./N.C.

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

Input Data	Data Type	Default Value	Valid Data Values
None			

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

5.2.6 Digital 2 POINT Output - With Over Load and Open Load Diagnostic Status

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OB2E	2 POINT 10V…28V dc Electronically Fused Output, Source
1734-OB2EP	2 POINT 10V…28V dc Electronically Fused Protected Output, Source

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
No Load Enable - POINT 0, 1 (Wire Off Diagnostic)	SINT, BIT	1	0=Disabled **1=Enabled**
Auto Restart Enable - POINT 0, 1 (Over Load Behavior)	SINT, BIT	0	**0=Latch Off** 1=Auto Retry
Fault Latch Enable - POINT 0, 1 (Open Load or Over Load)	SINT, BIT	0	**0=No Latching** 1=Alarms Latch

Input Data	Data Type	Default Value	Valid Data Values
Status Data - POINT 0, 1 (Open Load or Over Load)	SINT, BIT	0	**0=Off** 1=On (Load Fault)

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

5.2.7 Digital 2 POINT Output - With Over Load Diagnostic Status

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OV2E	2 POINT 10V…28V dc Electronically Fused Output, Sink

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
Auto Restart Enable - POINT 0, 1 (Over Load Behavior)	SINT, BIT	0	**0=Latch Off** 1=Auto Retry
Fault Latch Enable - POINT 0, 1 (Over Load)	SINT, BIT	0	**0=No Latching** 1=Alarms Latch

Input Data	Data Type	Default Value	Valid Data Values
Status Data - POINT 0, 1 (Over Load)	SINT, BIT	0	**0=Off** 1=On (Load Fault)

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

5.2.8 Digital 4 POINT Output - With Over Load and Open Load Diagnostic Status

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OB4E	4 POINT 10V…28V dc Electronically Fused Output, Source

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On
No Load Enable - POINT 0, 1, 2, 3 (Wire Off Diagnostic)	SINT, BIT	1	0=Disabled **1=Enabled**
Auto Restart Enable - POINT 0, 1, 2, 3 (Over Load Behavior)	SINT, BIT	0	**0=Latch Off** 1=Auto Retry
Fault Latch Enable - POINT 0, 1, 2, 3 (Open Load or Over Load)	SINT, BIT	0	**0=No Latching** 1=Alarms Latch

Input Data	Data Type	Default Value	Valid Data Values
Status Data - POINT 0, 1, 2, 3 (Open Load or Over Load)	SINT, BIT	0	**0=Off** 1=On (Load Fault)

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On

5.2.9 Digital 4 POINT Output - With Over Load Diagnostic Status

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OV4E	4 POINT 10V…28V dc Electronically Fused Output, Sink

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On
Auto Restart Enable - POINT 0, 1, 2, 3 (Over Load Behavior)	SINT, BIT	0	**0=Latch Off** 1=Auto Retry
Fault Latch Enable - POINT 0, 1, 2, 3 (Over Load)	SINT, BIT	0	**0=No Latching** 1=Alarms Latch

Input Data	Data Type	Default Value	Valid Data Values
Status Data - POINT 0, 1, 2, 3 (Over Load)	SINT, BIT	0	**0=Off** 1=On (Load Fault)

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On

5.2.10 Analog 2 Channel Input

1734-IE2C

1734 POINT I/O Catalog Number	RSLogix5000 Module Description		
1734-IE2C	2 Channel Analog Current Input		
Configuration Data	**Data Type**	**Default Value**	**Valid Data Values**
Low Engineering Channel 0	INT	3,277	-32,768…32,767
High Engineering Channel 0	INT	16,383	-32,768…32,767
Digital Filter Channel 0	INT	0	0…10,000 ms
Low Alarm Limit Channel 0	INT	3,113	-32,768…32,767
High Alarm Limit Channel 0	INT	16,547	-32,768…32,767
Low Low Alarm Limit Channel 0	INT	2,867	-32,768…32,767
High High Alarm Limit Channel 0	INT	16,793	-32,768…32,767
Range Type Channel 0	SINT	3	**3=4…20 mA** 8=0…20 mA
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Low Engineering Channel 1	INT	3,277	-32,768…32,767
High Engineering Channel 1	INT	16,383	-32,768…32,767
Digital Filter Channel 1	INT	0	0…10,000 ms
Low Alarm Limit Channel 1	INT	3,113	-32,768…32,767
High Alarm Limit Channel 1	INT	16,547	-32,768…32,767
Low Low Alarm Limit Channel 1	INT	2,867	-32,768…32,767
High High Alarm Limit Channel 1	INT	16,793	-32,768…32,767
Range Type Channel 1	SINT	3	**3=4-20 mA** 8=0-20 mA
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Notch Filter (Channel 0 & 1)	SINT	2	1=50 Hz **2=60 Hz** 4=250 Hz 6=500 Hz
Real-time Sample (Channel 0 & 1)	INT	100	0…10,000 ms

1734-IE2C

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IE2C	2 Channel Analog Current Input

Input Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768…32,767
Data Channel 1	INT	0	-32,768…32,767
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange

Output Data	Data Type	Default Value	Valid Data Values
None			

1734-IE2V

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IE2V	2 Channel Analog Voltage Input

Configuration Data	Data Type	Default Value	Valid Data Values
Low Engineering Channel 0	INT	0	-32,768…32,767
High Engineering Channel 0	INT	10,000	-32,768…32,767
Digital Filter Channel 0	INT	0	0…10,000 ms
Low Alarm Limit Channel 0	INT	500	-32,768…32,767
High Alarm Limit Channel 0	INT	9,500	-32,768…32,767
Low Low Alarm Limit Channel 0	INT	200	-32,768…32,767
High High Alarm Limit Channel 0	INT	9,800	-32,768…32,767
Range Type Channel 0	SINT	2	0=-10…+10V **2=0…10V**
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Low Engineering Channel 1	INT	0	-32,768…32,767
High Engineering Channel 1	INT	10,000	-32,768…32,767
Digital Filter Channel 1	INT	0	0…10,000 ms
Low Alarm Limit Channel 1	INT	500	-32,768…32,767
High Alarm Limit Channel 1	INT	9,500	-32,768…32,767
Low Low Alarm Limit Channel 1	INT	200	-32,768…32,767
High High Alarm Limit Channel 1	INT	9,800	-32,768…32,767
Range Type Channel 1	SINT	2	0=-10…+10V **2=0…10V**
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Notch Filter (Channel 0 & 1)	SINT	2	1=50 Hz **2=60 Hz** 4=250 Hz 6=500 Hz
Real-time Sample (Channel 0 & 1)	INT	100	0…10,000 ms

1734-IE2V

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IE2V	2 Channel Analog Voltage Input

Input Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768…32,767
Data Channel 1	INT	0	-32,768…32,767
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange

Output Data	Data Type	Default Value	Valid Data Values
None			

1734-IR2

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IR2	2 Channel RTD Input

Configuration Data	Data Type	Default Value	Valid Data Values
Low Engineering Channel 0	INT	1,000	-32,768…32,767
High Engineering Channel 0	INT	5,000	-32,768…32,767
Digital Filter Channel 0	INT	0	0…10,000 ms
Low Alarm Limit Channel 0	INT	-32,768	-32,768…32,767
High Alarm Limit Channel 0	INT	32,767	-32,768…32,767
Low Low Alarm Limit Channel 0	INT	-32,768	-32,768…32,767
High High Alarm Limit Channel 0	INT	32,767	-32,768…32,767
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Sensor Type Channel 0	SINT	1	0=Ohms **1=100 Pt 385** 2=200 Ω Pt α 385 5=100 Ω JPt α 3916 6=200 Ω JPt α 3916 9=10 Ω Cu α 427 10=120 Ω Ni α 672 11=100 Ω Ni α 618 12=120 Ω Ni α 618
Temperature Mode Channel 0	SINT	1	0=Custom Scale **1=°C** 2=°F 3=°K 4=°R
Low Engineering Channel 1	INT	1,000	-32,768…32,767
High Engineering Channel 1	INT	5,000	-32,768…32,767
Digital Filter Channel 1	INT	0	0…10,000 ms
Low Alarm Limit Channel 1	INT	-32,768	-32,768…32,767
High Alarm Limit Channel 1	INT	32,767	-32,768…32,767
Low Low Alarm Limit Channel 1	INT	-32,768	-32,768…32,767
High High Alarm Limit Channel 1	INT	32,767	-32,768…32,767
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled

1734-IR2

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IR2	2 Channel RTD Input

Configuration Data	Data Type	Default Value	Valid Data Values
Sensor Type Channel 1	SINT	1	0=Ohms **1=100 Pt 385** 2=200 Ω Pt α 385 5=100 Ω JPt α 3916 6=200 Ω JPt α 3916 9=10 Ω Cu α 427 10=120 Ω Ni α 672 11=100 Ω Ni α 618 12=120 Ω Ni α 618
Temperature Mode Channel 1	SINT	1	0=Custom Scale **1=°C** 2=°F 3=°K 4=°R
Notch Filter (Channel 0 & 1)	SINT	1	0=50 Hz **1=60 Hz** 2=100 Hz 3=120 Hz 4=200 Hz 5=240 Hz 6=300 Hz 7=400 Hz 8=480 Hz

Input Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768…32,767
Data Channel 1	INT	0	-32,768…32,767
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange

Input Data	Data Type	Default Value	Valid Data Values
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange

Output Data	Data Type	Default Value	Valid Data Values
None			

1734-IT2

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IT2	2 Channel Thermocouple Input, Isol.

Configuration Data	Data Type	Default Value	Valid Data Values
Cold Junction Notch Filter	SINT	1	0=50 Hz **1=60 Hz**
Cold Junction Mode	SINT	1	0=None **1=Channel 0** 2=Channel 1 3=Average Both
Low Engineering Channel 0	INT	0	-32,768…32,767
High Engineering Channel 0	INT	7,000	-32,768…32,767
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Notch Filter Channel 0	SINT	1	0=50 Hz **1=60 Hz** 2=100 Hz 3=120 Hz 4=200 Hz 5=240 Hz 6=300 Hz 7=400 Hz 8=480 Hz
Sensor Type Channel 0	SINT	5	0=mV 1=B 2=C 3=E 4=J **5=K** 6=N 7=R 8=S 9=T
Digital Filter Channel 0	INT	0	0…10,000 ms
Low Alarm Limit Channel 0	INT	-32,768	-32,768…32,767
High Alarm Limit Channel 0	INT	32,767	-32,768…32,767
Low Low Alarm Limit Channel 0	INT	-32,768	-32,768…32,767
High High Alarm Limit Channel 0	INT	32,767	-32,768…32,767

1734-IT2

1734 POINT I/O Catalog Number	RSLogix5000 Module Description		
1734-IT2	2 Channel Thermocouple Input, Isol.		
Configuration Data	**Data Type**	**Default Value**	**Valid Data Values**
Temperature Mode Channel 0	SINT	1	0=mV/Custom Scale **1=°C** 2=°F 3=°K 4=°R
Cold Junction Enable Channel 0	SINT	1	0=Disabled **1=Enabled**
Cold Junction Offset Channel 0	INT	0	0…7,000 (0.00…70.00)
Low Engineering Channel 1	INT	0	-32,768…32,767
High Engineering Channel 1	INT	7,000	-32,768…32,767
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Notch Filter Channel 1	SINT	1	0=50 Hz **1=60 Hz** 2=100 Hz 3=120 Hz 4=200 Hz 5=240 Hz 6=300 Hz 7=400 Hz 8=480 Hz
Sensor Type Channel 1	SINT	5	0=mV 1=B 2=C 3=E 4=J **5=K** 6=N 7=R 8=S 9=T
Digital Filter Channel 1	INT	0	0…10,000 ms
Low Alarm Limit Channel 1	INT	-32,768	-32,768…32,767
High Alarm Limit Channel 1	INT	32,767	-32,768…32,767
Low Low Alarm Limit Channel 1	INT	-32,768	-32,768…32,767
High High Alarm Limit Channel 1	INT	32,767	-32,768…32,767

1734-IT2

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IT2	2 Channel Thermocouple Input, Isol.

Configuration Data	Data Type	Default Value	Valid Data Values
Temperature Mode Channel 1	SINT	1	0=mV/Custom Scale **1=°C** 2=°F 3=°K 4=°R
Cold Junction Enable Channel 1	SINT	1	0=Disabled **1=Enabled**
Cold Junction Offset Channel 1	INT	0	0…7,000 (0.00…70.00)

Input Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768…32,767
Data Channel 1	INT	0	-32,768…32,767
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Cold Junction Data	INT	0	-32,768…32,767

Output Data	Data Type	Default Value	Valid Data Values
None			

1734-OE2C

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OE2C	2 Channel Analog Current Output

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Value Channel 0	INT	0	-32,768…32,767
Program Value Channel 0	INT	0	-32,768…32,767
Low Engineering Channel 0	INT	1,638	-32,768…32,767
High Engineering Channel 0	INT	8,191	-32,768…32,767
Low Limit Channel 0	INT	-32,768	-32,768…32,767
High Limit Channel 0	INT	32,767	-32,768…32,767
Range Type Channel 0	SINT	0	**0=4…20 mA** 2=0…20 mA
Fault Mode Channel 0	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Idle Mode Channel 0	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Fault Value Channel 1	INT	0	-32,768…32,767
Program Value Channel 1	INT	0	-32,768…32,767
Low Engineering Channel 1	INT	1,638	-32,768…32,767
High Engineering Channel 1	INT	8,191	-32,768…32,767
Low Limit Channel 1	INT	-32,768	-32,768…32,767
High Limit Channel 1	INT	32,767	-32,768…32,767
Range Type Channel 1	SINT	0	**0=4…20 mA** 2=0…20 mA
Fault Mode Channel 1	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value

1734-OE2C

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OE2C	2 Channel Analog Current Output

Configuration Data	Data Type	Default Value	Valid Data Values
Idle Mode Channel 1	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled

Input Data	Data Type	Default Value	Valid Data Values
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm

Output Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768…32,767
Data Channel 1	INT	0	-32,768…32,767

1734-OE2V

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OE2V	2 Channel Analog Voltage Output

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Value Channel 0	INT	0	-32,768…32,767
Program Value Channel 0	INT	0	-32,768…32,767
Low Engineering Channel 0	INT	0	-32,768…32,767
High Engineering Channel 0	INT	10,000	-32,768…32,767
Low Limit Channel 0	INT	-32,768	-32,768…32,767
High Limit Channel 0	INT	32,767	-32,768…32,767
Range Type Channel 0	SINT	1	**1=0…10V** 3=-10…+10V
Fault Mode Channel 0	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Idle Mode Channel 0	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Fault Value Channel 1	INT	0	-32,768…32,767
Program Value Channel 1	INT	0	-32,768…32,767
Low Engineering Channel 1	INT	0	-32,768…32,767
High Engineering Channel 1	INT	10,000	-32,768…32,767
Low Limit Channel 1	INT	-32,768	-32,768…32,767
High Limit Channel 1	INT	32,767	-32,768…32,767
Range Type Channel 1	SINT	1	**1=0…10V** 3=-10…+10V
Fault Mode Channel 1	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Idle Mode Channel 1	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value

1734-OE2V

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-OE2V	2 Channel Analog Voltage Output

Configuration Data	Data Type	Default Value	Valid Data Values
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled

Input Data	Data Type	Default Value	Valid Data Values
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm

Output Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768…32,767
Data Channel 1	INT	0	-32,768…32,767

5.2.11 Specialty I/O

1734-VHSC24, 1734-VHSC5

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-VHSC24	1 Channel 15…24V dc Very High-speed Counter
1734-VHSC5	1 Channel 5V dc Very High-speed Counter

Configuration Data	Data Type	Default Value	Valid Data Values
Counter Config	SINT	0	
Config_0	BIT 0		**0000=0=Counter**
Config_1	BIT 1		0001=1=Encoder X1
Config_2	BIT 2		0010=2=Encoder X2
Config_3	BIT 3		0011=3=PWM 0100=4=Encoder X4 0101=5=Period/Rate 0110=6=Continuous/Rate 0111=7=Rate Measurement 1000=8=Pulse Generator
Mode_4	BIT 4		**000=Store Count Disable**
Mode_5	BIT 5		001=Store/Continue
Mode_6	BIT 6		010=Store/Wait/Resume 011=Store,Reset/Wait/Start 100=Store,Reset/Start
Z Input	BIT 7		**0=Z Input Not Inverted** 1=Z Input Is Inverted
Filter	SINT	120 (0x78H)	
Filter_0	BIT 0		0000=No Filter
Filter_1	BIT 1		0001=50 kHz
Filter_2	BIT 2		0010=5 kHz
Filter_3	BIT 3		0100=500 Hz **1000=50 Hz**
FilterA	BIT 4		0=Input A/B/Z Not Filtered
FilterB	BIT 5		**1=Input A/B/Z Is Filtered**
FilterZ	BIT 6		
Decimal Position	SINT	0	Counter Config 0, 1, 2, 3, 4: -128…+127 (0…255) Counter Config 5, 6, & 7: -4…+2
Time Base (in 10 ms intervals)	INT	0	Counter Config 3 & 7 only: 0…3000 ms (10 ms…3 sec)
Gate Interval (Product of Time Base x Gate Interval must be ≤ 3000 ms)	SINT	0	Counter Config 3 & 7 only: -128…+127 (0…200)

1734-VHSC24, 1734-VHSC5

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-VHSC24	1 Channel 15…24V dc Very High-speed Counter
1734-VHSC5	1 Channel 5V dc Very High-speed Counter

Configuration Data	Data Type	Default Value	Valid Data Values
Scalar	SINT	0	Counter Config 5, 6, 8 only: -128…+127 (0…255) Single Bit only: 0, 1, 2, 4, 8, 16, 32, 64, -128
Output Ties 0	SINT	0	
Out 0 Window 1	BIT 0		**0=Output 0 Not Tied**
Out 0 Window 2	BIT 1		1=Output 0 Tied to Window
Out 0 Window 3	BIT 2		Counter Config 3 (PWM): Output 0 Window 1 PWM In
Out 0 Window 4	BIT 3		
Output Ties 1	SINT	0	
Out 1 Window 1	BIT 0		**0=Output 1 Not Tied**
Out 1 Window 2	BIT 1		1=Output 1 Tied to Window
Out 1 Window 3	BIT 2		Counter Config 3 (PWM): Output 1 Window 1 PWM In
Out 1 Window 4	BIT 3		
Rollover	DINT	16,777,215	1…16,777,216
Preset (< Rollover)	DINT	0	0…16,777,215
On Value 1	DINT	0	Counter Config 3, 5, 6, 7: 0…16,777,215
Off Value 1	DINT	0	
On Value 2	DINT	0	Counter Config 0, 1, 2, 4: 0 to Rollover Value
Off Value 2	DINT	0	
On Value 3	DINT	0	
Off Value 3	DINT	0	
On Value 4	DINT	0	
Off Value 4	DINT	0	
SS PWM Value (<0 or >9500 =Hold Last State)	INT	0	0…9500 (0.00…95.00%)
SS Counter Control	SINT	0	
SS Counter Reset	BIT 0		**0=Count Unchanged** 1=Count Cleared
SS Counter Preset	BIT 1		**0=Count Unchanged** 1=Count Set to Preset
SS Value Reset (Stored / Accum. Count)	BIT 2		**0=Count Unchanged** 1=Count Cleared

1734-VHSC24, 1734-VHSC5

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-VHSC24	1 Channel 15…24V dc Very High-speed Counter
1734-VHSC5	1 Channel 5V dc Very High-speed Counter

Configuration Data	Data Type	Default Value	Valid Data Values
SS Output Control	SINT	0	
SS Out 0 Force	BIT 0		**0=Output Off** 1=Output Forced On
SS Out 0 En	BIT 1		**0=Output Disabled** 1=Output Enabled
SS Out 0 Electronic Fuse	BIT 2		**0=Auto Retry** 1=Latch Off
SS Out 0 Diagnostic Speed	BIT 3		**0 ≤ 8 ms Response** 1=50 ms Response
SS Out 1 Force	BIT 4		**0=Output Off** 1=Output Forced On
SS Out 1 En	BIT 5		**0=Output Disabled** 1=Output Enabled
SS Out 1 Electronic Fuse	BIT 6		**0=Auto Retry** 1=Latch Off
SS Out 1 Diagnostic Speed	BIT 7		**0 ≤ 8 ms Response** 1=50 ms Response

To enter values from +128 to +255, use these conversion formulas:

- Desired Decimal Position Value - 256 = Entered Decimal Position Value.
  Example: for a divisor of 200, 200 - 256 = -56
- Desired Gate Interval Value - 256 = Entered Gate Interval Value.
  Example: for a Gate Interval of 200, 200 - 256 = -56
- Desired Scalar Value - 256 = Entered Scalar Value.
  Example: for a Scalar of 128, 128 - 256 = -128

1734-VHSC24, 1734-VHSC5

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-VHSC24	1 Channel 15…24V dc Very High-speed Counter
1734-VHSC5	1 Channel 5V dc Very High-speed Counter

Input Data	Data Type	Default Value	Valid Data Values
Present Data	DINT	0	0…16,777,215
Stored Data	DINT	0	-2,147,483,648…2,147,483,647 (0…4,294,967,295)
Status	INT	0	
Zero Frequency Detected	BIT 1		**0=No Fault** 1=Fault Detected
Stored Data Count_2 Stored Data Count_3	BIT 2 BIT 3		Cycles through **0**, 1, 2, 3, **0**, Increments after update
A Input Status B Input Status Z Input Status	BIT 4 BIT 5 BIT 6		**0=Input A/B/Z is Off** 1=Input A/B/Z is On
Output Status_8 (Output 0) Output Status_9 (Output 1)	BIT 8 BIT 9		**0=Output is Off** 1=Output is On
Output Fault_10 (Output 0) Output Fault_11 (Output 1)	BIT 10 BIT 11		**0=No Fault** 1=Open or Over Load
Not Ready	BIT 13		**0=Module Ready** 1=Module Initializing
EEPROM Fault	BIT 14		**0=No Fault** 1=EEPROM data bad
Program Fault (incomplete / incorrect / conflict)	BIT 15		**0=No Fault** 1=Bad Configuration (See Program Fault Note)

Stored Data

To interpret values from -2,147,483,648 to -1, use this conversion formula:

- Stored Data Tag Value + 4,294,967,296 = Actual Stored Data Tag Value.

  Example: for a read value of -1,794,967,296:
  -1,794,967,296 + 4,294,967,296 = 2,500,000,000 actual value

Program Fault

Programming Fault Error bit - If an incomplete, incorrect, or conflicting set of configuration parameters is sent to the module, the Program Fault bit will be asserted, and an error code will be placed in the Programming Error Code word (assembly 6816). The module will **not** enter a normal operational state. Bit definitions (decimal) for the error codes are:

Error Bit	Description
10	An invalid assembly was chosen for poll consumption (0, 105, or 106 are valid).
9	The decimal point position is outside of the acceptable range.
8	Counter 0 window ON & OFF values are equal and **not** zero OR Counter 0 window ON & OFF value is greater than Rollover.
7	A tie has been connected to an unprogrammed window.
6	A configuration was selected that requires the scalar and none was programmed OR Multiple scalars were selected.
5	The preset is out of range (Rollover).
4	A rollover of zero was programmed through PWM was not selected OR A rollover was programmed and PWM was selected OR Rollover is out of range (>0x01000000).
3	A configuration requiring a time base was selected and no gate interval was set OR Gate interval is out of range (>200) OR Product of time base and gate interval is greater than 3 seconds.
2	A time base was entered that is not a multiple of 10 OR Time base is out of range (>3000, or 3 seconds).
1	ZF/BF/AF were selected and no filter was programmed OR Multiple filters were selected.
0	A reserved configuration/mode was programmed.

1734-VHSC24, 1734-VHSC5

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-VHSC24	1 Channel 15…24V dc Very High-speed Counter
1734-VHSC5	1 Channel 5V dc Very High-speed Counter

Output Data	Data Type	Default Value	Valid Data Values
PWM Value	INT	0	**0**…9500 (**0.00**…95.00%)
Counter Control	SINT	0	
Counter Reset	BIT 0	0	**0=Count Unchanged** 1=Count Cleared
Counter Preset	BIT 1	0	**0=Count Unchanged** 1=Count Set to Preset
Value Reset (Stored / Accumulated Count)	BIT 2	0	**0=Count Unchanged** 1=Count Cleared
Output Control	SINT	0	
Output 0 Force	BIT 0	0	**0=Output Off** 1=Output Forced On
Output 0 Enable	BIT 1	0	**0=Output Disabled** 1=Output Enabled
Output 0 Electronic Fuse	BIT 2	0	**0=Auto Retry** 1=Latch Off
Output 0 Diagnostic Speed	BIT 3	0	**0≤ 8 ms Response** 1=50 ms Response
Output 1 Force	BIT 4	0	**0=Output Off** 1=Output Forced On
Output 1 Enable	BIT 5	0	**0=Output Disabled** 1=Output Enabled
Output 1 Electronic Fuse	BIT 6	0	**0=Auto Retry** 1=Latch Off
Output 1 Diagnostic Speed	BIT 7	0	**0≤ 8 ms Response** 1=50 ms Response

1734-IJ, 1734-IK

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IJ	1 Channel 5V dc Encoder / Counter
1734-IK	1 Channel 15…24V dc Encoder / Counter

Configuration Data	Data Type	Default Value	Valid Data Values
Counter Config	SINT	0	
Config_0	BIT 0		**0000=0=Counter**
Config_1	BIT 1		0001=1=Encoder X1
Config_2	BIT 2		0010=2=Encoder X2
Config_3	BIT 3		0100=4=Encoder X4
			0101=5=Period/Rate
			0111=7=Rate Measurement
Mode_4	BIT 4		**000=Store Count Disable**
Mode_5	BIT 5		001=Store/Continue
Mode_6	BIT 6		010=Store/Wait/Resume
			011=Store,Reset/Wait/Start
			100=Store,Reset/Start
Z Input	BIT 7		**0=Z Input Not Inverted**
			1=Z Input Is Inverted
Filter	SINT	120 (0x78H)	
Filter_0	BIT 0		0000=No Filter
Filter_1	BIT 1		0001=50 kHz
Filter_2	BIT 2		0010=5 kHz
Filter_3	BIT 3		0100=500 Hz
			1000=50 Hz
FilterA	BIT 4		0=Input A/B/Z Not Filtered
FilterB	BIT 5		**1=Input A/B/Z Is Filtered**
FilterZ	BIT 6		
Decimal Position	SINT	0	Counter Config 0, 1, 2, 4: -128…+127 (0…255) Counter Config 5 & 7: -4…+2
Time Base (in 10 ms intervals)	INT	0	Counter Config 7 only: 0…3000 ms (10 ms…3 s)
Gate Interval (Product of Time Base x Gate Interval must be ≤ 3000 ms)	SINT	0	Counter Config 7 only: -128…+127 (0…200)
Scalar	SINT	0	Counter Config 5 only: -128…+127 (0…255) 0, 1, 2, 4, 8, 16, 32, 64, -128
Rollover	DINT	16,777,215	1…16,777,216
Preset (< Rollover)	DINT	0	0…16,777,215

1734-IJ, 1734-IK

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IJ	1 Channel 5V dc Encoder / Counter
1734-IK	1 Channel 15…24V dc Encoder / Counter

Configuration Data	Data Type	Default Value	Valid Data Values
SS Counter Control	SINT	0	
SS Counter Reset	BIT 0		**0=Count Unchanged** 1=Count Cleared
SS Counter Preset	BIT 1		**0=Count Unchanged** 1=Count Set to Preset
SS Value Reset	BIT 2		**0=Count Unchanged** 1=Count Cleared

To enter values from +128 to +255, use these conversion formulas:

- Decimal Position

  Desired Decimal Position Value - 256 = Entered Decimal Position Value.
  Example: for a divisor of 200, 200 - 256 = -56

- Gate Interval

  Desired Gate Interval Value - 256 = Entered Gate Interval Value.
  Example: for a Gate Interval of 200, 200 - 256 = -56

- Scalar

  Desired Scalar Value - 256 = Entered Scalar Value.
  Example: for a Scalar of 128, 128 - 256 = -128

1734-IJ, 1734-IK

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IJ	1 Channel 5V dc Encoder / Counter
1734-IK	1 Channel 15…24V dc Encoder / Counter

Input Data	Data Type	Default Value	Valid Data Values
Present Data	DINT	0	0…16,777,215
Stored Data	DINT	0	-2,147,483,648… 2,147,483,647 (0…4,294,967,295)
Status	INT	0	
Zero Frequency Detected	BIT 1		**0=No Fault** 1=Fault Detected
Stored Data Count_2	BIT 2		Cycles through **0**, 1, 2, 3, **0**,
Stored Data Count_3	BIT 3		Increments after update
A Input Status	BIT 4		**0=Input A/B/Z is Off**
B Input Status	BIT 5		1=Input A/B/Z is On
Z Input Status	BIT 6		
Not Ready	BIT 13		**0=Module Ready** 1=Module Initializing
EEPROM Fault	BIT 14		**0=No Fault** 1=EEPROM data bad
Program Fault (incomplete / incorrect / conflict)	BIT 15		**0=No Fault** 1=Bad Configuration (See Program Fault Note)

Stored Data

To interpret values from -2,147,483,648 to -1, use this conversion formula:

- Stored Data Tag Value + 4,294,967,296 = Actual Stored Data Tag Value.

  Example: for a read value of -1,794,967,296:-1,794,967,296 + 4,294,967,296 = 2,500,000,000 actual value

Program Fault Note

Programming Fault Error bit - If an incomplete, incorrect, or conflicting set of configuration parameters is sent to the module, the Program Fault bit is asserted, and an error code placed in the Programming Error Code word (assembly 6816). The module will **not** enter a normal operational state. Bit definitions (decimal) for the error codes are:

Error Bit	Description
10	An invalid assembly was chosen for poll consumption (0, 105, or 106 are valid).
9	The decimal point position is outside of the acceptable range.
8	Counter 0 window ON & OFF values are equal and **not** zero OR Counter 0 window ON & OFF value is greater than the Rollover.
7	A tie has been connected to an unprogrammed window.
6	A configuration was selected that requires the scalar and none was programmed OR Multiple scalars were selected.
5	The preset is out of range (Rollover).
4	A rollover of zero was programmed through PWM was not selected OR A rollover was programmed and PWM was selected OR Rollover is out of range (>0x01000000).
3	A configuration requiring a time base was selected and no gate interval was set OR Gate interval is out of range (>200) OR Product of time base and gate interval is greater than 3 seconds.
2	A time base was entered that is not a multiple of 10 OR Time base is out of range (>3000, or 3 seconds).
1	ZF/BF/AF were selected and no filter was programmed OR Multiple filters were selected.
0	A reserved configuration/mode was programmed.

1734-IJ, 1734-IK

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-IJ	1 Channel 5V dc Encoder / Counter
1734-IK	1 Channel 15…24V dc Encoder / Counter

Output Data	Data Type	Default Value	Valid Data Values
Counter Control	SINT	0	
Counter Reset	BIT 0	0	**0=Count Unchanged** 1=Count Cleared
Counter Preset	BIT 1	0	**0=Count Unchanged** 1=Count Set to Preset
Value Reset (Stored / Accumulated Count)	BIT 2	0	**0=Count Unchanged** 1=Count Cleared

1734-SSI

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-SSI	1 Channel Synchronous Serial Interface

Configuration Data	Data Type	Default Value	Valid Data Values
Run	SINT	1	0=Module Not Running **1=Module Is Running**
Gray Binary	SINT	1	0=Binary Code **1=Gray Code**
Word Length	SINT	13	2…31
Data Speed	SINT	5	**5=125 Kbps** 6=250 Kbps 7=500 Kbps 8=1 MB 9=2 MB
G2B Convert (Gray to Binary)	SINT	0	**0=No Convert** 1=Convert
Standardization (Divide / Shift using Trailing)	SINT	0	**0=No Standardization** 1=Apply Standardization
SSI Word Delay Time	INT	64	-32,768…32,767 µs (16…65,535)
Trailing (No. of Trailing Bits)	SINT	0	**0**…16
Input Latch Control InputLatch_0 InputLatch_1	SINT BIT 0 BIT 1	0	**00=Off** 01=Falling Edge of Input 10=Rising Edge of Input 11=Both Edges of Input
Sensor Resolution (Positions per Rev. or Stroke)	INT	1	-32,768……32,767 counts (1…65,535)
Sensor Cycle (Total Revolutions or Strokes)	INT	1	-32,768…32,767 counts (1…65,535)
Compare 0 Value	DINT	0	-2,147,483,648… 2,147,483,647 (0…4,294,967,295)
Compare 1 Value	DINT	0	-2,147,483,648… 2,147,483,647 (0…4,294,967,295)
Compare 0 Control Compare0_0 Compare0_1	SINT BIT 0 BIT 1	0	**00=Off** 01=Up Direction 10=Down Direction 11=Both Directions
Compare 1 Control; Compare1_0 Compare1_1	SINT BIT 0 BIT 1	0	**00=Off** 01=Up Direction 10=Down Direction 11=Both Directions

SSI Word Delay Time

To enter Delay values from +32,768 to +65,535 µs, use this conversion formula:

- Desired Delay Value (in µs) - 65536 = Entered Delay Value (in µs).

  Example: for a 40 ms delay time, 40000 - 65536 = -25536

Sensor Resolution

To enter Resolution values from +32,768 to +65,535 µs, use this conversion formula:

- Desired Resolution Value - 65536 = Entered Resolution Value.

  Example: for a 40,000 count sensor, 40000 - 65536 = -25536

Sensor Cycle

To enter Cycle values from +32,768 to +65,535, use this conversion formula:

- Desired Cycle Value - 65536 = Entered Cycle Value.

  Example: for 50,000 sensor cycle rotations, 50000 - 65536 = -15536
  Compare 0,1 Value

To enter Compare values from +2,147,483,647 to +4,294,967,295, use this conversion formula:

- Desired Compare Value - 4,294,967,296 = Entered Compare Value.

  Example: for a 3,000,000,000 compare value,
  3,000,000,000 - 4,294,967,296 = -1,294,967,296

1734-SSI

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-SSI	1 Channel Synchronous Serial Interface

Input Data	Data Type	Default Value	Valid Data Values
Present Data	DINT	0	-2,147,483,648…2,147,483,647 (0…4,294,967,295)
Latched Data	DINT	0	-2,147,483,648…2,147,483,647 (0…4,294,967,295)
Status	INT	0	
Input Status	BIT 0		**0=Input is Off** 1=Input is On
Run	BIT 1		**0=Module is not Running** 1=Module is Running
Decreasing Count	BIT 2		**0=Count not Decreasing** 1=Count is Decreasing
Increasing Count	BIT 3		**0=Count not Increasing** 1=Count is Increasing
Compare0 Reached Compare1 Reached	BIT 4 BIT 5		**0=Compare not Reached** 1=Compare was Reached
Compare0 Status Compare1 Status	BIT 6 BIT 7		**0=Compare Off** 1=Compare On
Power Fault	BIT 8		**0=No 24Vdc Power Fault** 1=24Vdc Power Fault
Configuration Fault	BIT 9		**0=No FPGA Config Fault** 1=FPGA Config data bad
Communication Fault	BIT 10		**0=No FPGA Comm Fault** 1=FPGA Comm Fault
Input Data Fault	BIT 11		**0=No Input Data Fault** 1=Input Power Fault (short)
Data Latched	BIT 12		**0=Input Data Not Latched** 1=Input Data Latched

Present / Latched Data

To interpret values from -2,147,483,648 to -1, use this conversion formula:

- Stored Data Tag Value + 4,294,967,296 = Actual Stored Data Tag Value.

  Example: for a read value of -1,794,967,296:
  -1,794,967,296 + 4,294,967,296 = 2,500,000,000 actual value

1734-SSI

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-SSI	1 Channel Synchronous Serial Interface

Output Data	Data Type	Default Value	Valid Data Values
Control	SINT	0	
Latch Acknowledge	BIT 0	0	**0=Latch Not Cleared** 1=Latch Cleared
Compare 0 Acknowledge	BIT 1	0	**0=Compare0 Not Reset** 1=Compare0 Reset
Compare 1 Acknowledge	BIT 2	0	**0=Compare1 Not Reset** 1=Compare1 Reset
Compare 0 Select	BIT 3	0	**0=Compare0 Not Selected** 1=Compare0 Selected
Compare 1 Select	BIT 4	0	**0=Compare1 Not Selected** 1=Compare1 Selected

1734-232ASC

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-232ASC	1 Channel ASCII Interface Module

Configuration Data	Data Type	Default Value	Valid Data Values
Serial Character Format (ASCII Format: Data Bits / Parity / Stop)	SINT	0	**0=7N2** 1=7E1 2=7O1 3=8N1 4=8N2 5=8E1 6=8O1 7=7E2 8=7O2
Serial Comm Speed (Communication Rate of the Serial Port)	SINT	0	**0=9600 Kbps** 1=1200 Kbps 2=2400 Kbps 3=4800 Kbps 4=19.2 KBps 5=38.4 KBps
Max Receive Characters	SINT	20	-128…+127 (0…128)
Receive Start Delimiter Mode	SINT	0	**0=No Start Delimiter** 1=Exclude Start Delimiter 2=Include Start Delimiter
Receive Start Delimiter Character	SINT	58 (0x3A)	Any Valid ASCII Character (Default is Colon [:])
Receive Record End Mode	SINT	2	0=No End Delimiter 1=Exclude End Delimiter **2=Include End Delimiter**
Receive End Delimiter	SINT	13 (0x0d)	Any Valid ASCII Character (Default is Carr. Return)
Receive String Data Type	SINT	1	0=Array **1=Short String** 2=String
Pad Mode	SINT	1	0=Pad Mode Disabled **1=Pad Mode Enabled**
Pad Character	SINT	0 (0x00)	Any Valid ASCII Character (Default is NULL)
Receive Swap Mode	SINT	0	**0=Disabled** 1=16-bit Swap Enabled 2=24-bit Swap Enabled 3=32-bit Swap Enabled
DeviceNet Handshake Mode	SINT	1	0=Master/Slave handshake **1=Produce Immediate**
Max Transmit Characters	SINT	20	-128…+127 (0…128)

1734-232ASC

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-232ASC	1 Channel ASCII Interface Module

Configuration Data	Data Type	Default Value	Valid Data Values
Transmit End Delimiter Mode	SINT	2	0=No End Delimiter 1=Exclude End Delimiter **2=Include End Delimiter**
Transmit End Delimiter Character	SINT	13 (0x0d)	Any Valid ASCII Character (Default is Carr. Return)
Consume String Data Type	SINT	1	0=Array **1=Short String** 2=String
Transmit Swap Mode	SINT	0	**0=Disabled** 1=16-bit Swap Enabled 2=24-bit Swap Enabled 3=32-bit Swap Enabled
DeviceNet Record Header Mode	SINT	0	**0=Transmit Handshake** 1=Transmit Immediate

Transmit Data / Receive Data / Delimiter / Pad Character

Note: 7 data bits allows ASCII Character data values of 0 to 127, which RSLogix 5000 software does support in the signed Short Integer data type SINT (-128 to +127 range).
Note that 8 data bits allows ASCII Character data values of 0 to 255.
To enter values from +128 to +255, use this conversion formula:
Desired Decimal Value - 256 = Entered Decimal Value.
Example: for an ASCII Character value of 128,
128 - 256 = -128

1734-232ASC

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
1734-232ASC	1 Channel ASCII Interface Module

Input Data	Data Type	Default Value	Valid Data Values
Receive Record Number	SINT	0	-128…+127 (0…255)
Status	SINT	0	
TX FIFO Overflow	BIT 0		**0=No Error** 1=TX FIFO Overflow Error
RX FIFO Overflow	BIT 1		**0=No Error** 1=RX FIFO Overflow Error
RX Parity Error	BIT 2		**0=No Error** 1=RX Parity Overflow Error
Handshake Error	BIT 6		**0=No Error** 1=Handshake Error
New Data Flag	BIT 7		**0=No New Data** 1=New Data Present
Length_Lo	SINT	20	-128…+127 (0…128)
Length_Hi	SINT	0	0 or 1
Data[128]	SINT	0	Received ASCII Message

Output Data	Data Type	Default Value	Valid Data Values
Transmit Record Number	SINT	0	-128…+127 (0…255)
Receive Record Number	SINT	0	-128…+127 (0…255)
Status	SINT	0	
TX FIFO Overflow	BIT 0		**0=No Error** 1=TX FIFO Overflow Error
RX FIFO Overflow	BIT 1		**0=No Error** 1=RX FIFO Overflow Error
RX Parity Error	BIT 2		**0=No Error** 1=RX Parity Overflow Error
Handshake Error	BIT 6		**0=No Error** 1=Handshake Error
New Data Flag	BIT 7		**0=No New Data** 1=New Data Present
Length_Lo	SINT	20	-128…+127 (0…128)
Length_Hi	SINT	0	0 or 1
Data[128]	SINT	0	Transmitted ASCII Message

Transmit Record Number/ Receive Record Number / Length_Lo

Note: 7 data bits allows Transmit / Receive record Number of Length_Lo values of 0 to 127, which RSLogix 5000 software does support in the signed Short Integer data type SINT (-128 to +127 range).
Note that 8 data bits allows Transmit / Receive record Number of Length_Lo values of 0 to 255.
To enter values from +128 to +255, use this conversion formula:
Desired Decimal Value - 256 = Entered Decimal Value.
Example: for a Transmit / Receive record Number of Length_Lo value of 128, 128 - 256 = -128

6 Reference

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6.1 Product Specifications

The ProSoft Technology® Wireless POINT I/O Adapter is a high-speed, standards-based 802.11g wireless input/output (I/O) communication adapter offering a convenient wireless alternative for linking Rockwell Automation® controllers to distributed process I/O modules. Combining Rockwell Automation's field proven I/O with ProSoft Technology's Integrated Wireless Architecture™ technology and support, the Wireless POINT I/O Adapter provides users an optimum distributed I/O communication solution.

The Wireless POINT I/O Adapter Add-On Profile (AOP) utilizes the familiar RSLogix™ 5000 programming environment and connection-based EtherNet/IP™ protocol to simplify configuring and communicating with POINT I/O racks scattered throughout the process facility. The compact size of POINT I/O systems, when coupled with the Wireless POINT I/O Adapter, make them ideal for collecting data from and controlling moving systems such as robots, automated carts, overhead cranes, earthmovers, as well as fixed-position racks in hard-to-reach areas of the process plant.

The Wireless POINT I/O Adapter can be used in networks with RadioLinx® Industrial Hotspots or third party 802.11g access points to provide high-speed, low latency 802.11g client communication over widely spaced plant areas. This ability to work with existing standards-based wireless technology protects and leverages the end-users' investment. For security, the Wireless POINT I/O employs 802.11i WPA2 with AES Encryption.

6.1.1 General Specifications

- Data communication interface via IEEE 802.11g 54Mb Wireless standard
- Configuration interface via 10/100 full/half duplex Cat5 cable
- EtherNet/IP messages encapsulated within standard TCP/UDP/IP protocol
- Half/full duplex 54 Mbps wireless operation
- Communication to and from other POINT I/O modules on the same DIN-rail
- Communication supported by RSLinx software
- I/O configuration via RSLogix™ 5000 software
- No network scheduling required
- No routing tables required
- Support of connections from multiple controllers simultaneously

6.1.2 Functional Specifications

Expansion I/O Capacity	
POINTBus Current Output	ILX34-AENWG uses 1.0A, 300 mA available for I/O modules. Use 1734-EP24DC backplane extension power supplies to extend beyond 300 mA
Maximum # of Modules	63 modules
Max # of Rack Optimized Connections	5 for digital I/O modules only
Max # of direct connections	20

6.1.3 Hardware Specifications

Power Supply	
Input Voltage	24V DC nominal 10-28.8 V range
Power Consumption	10.0 W max @ 28.8 VDC
Input Protection	Reverse Polarity, Transients
Isolation Voltage	1800 VDC for 60 sec

General	
Indicators (RF status)	Link, Activity
POINTBus Output Current	300 mA maximum
Thermal Dissipation	9.5 BTU / hr maximum
Dimensions inches (mm)	3.0H x 2.16W x 5.25L (76.2H x 54.9W x 133.4L)
Mass	12 oz / 340 grams
EtherNet Connector	RJ-45, Category 5

Environmental	
Operating Temperature	-20° to 55° C. IEC 60068-2 -1 cold, -2 dry heat, -14 thermal shock

Storage Temp	-40° to 85° C
Relative Humidity	5 to 95% noncondensing. IEC 60068-2-30
Shock	IEC 60068-2-27 30g operating 50g nonoperating
Vibration	IEC 60068-2-6 5g 10-500Hz
ESD Immunity	IEC 60068-4-2 6kV contact discharge 8kV air discharge
Radiated RF Immunity	IEC 60068-4-3 10V/m 1kHz sine AM Modulation 30MHz to 2GHz 10V/m 200 Hz AM Pulse 50% to 100 % frequencies
EFT/B Immunity	IEC 61000-4-5 4kV at 5kHz power ports, 2kV 5.0kHz communication ports
Surge Transient Immunity	IEC 61000-4-5 1kV line-line (DM) and 2kV line-earth (CM) on comm. Ports 1kV line-line (DM) and 2kV line-earth (CM) on power ports
Conducted RF Immunity	IEC 61000-4-6 10Vrms 1kHz sine 80% modulation AM 150kHz to 80MHz
Emissions	CISPR 11 Group 1 Class A
Enclosure rating	None (open style)

Radio / RF	
Communication standard	802.11g
Security	802.11i (WPA2)
Encryption	None, WEP, AES
RF Power	12 dBm (16 mW) without antenna gain – allows up to 6 dBi antenna for ETSI, 100 mW EIRP limited countries
Antenna connection	One RP-SMA connector
IGMP querying support	Use of WDS to support IGMP querying and multicast
Indoor distance	100 meters at 54 Mbps (use RadioLinx® Industrial Hotspots radios to extend range)
Outdoor distance	Up to 3 km with high gain, directional antennas and RF line-of-sight

Enclosure	
Cover	Molded plastic, integrated DIN rail clip
All other components	Supplied by Rockwell Automation® standard 1734-AENTR parts
Enclosure rating	None (open style)

LED Indicators	▪ Link ▪ Activity ▪ System Power ▪ Field Power ▪ Module Status ▪ Network Status ▪ Network Activity ▪ POINTBus Status

Performance	
Wireless packets per second	Up to 1000
RSLogix I/O Configuraton Requested Packet Interval, Typical for one adapter per single 802.11 network	Allow 20 ms per I/O connection Example: Set RPI = 100ms for 5 I/O connections (For recommended RPI using multiple adapters per single network, contact ProSoft Technical Support)

6.1.4 Supported Software and Hardware Versions

Product	Version
RSLogix5000	v17
RSLinx	v2.54
1756-EN2T	v2.005
1756-ENBT	v4.007
1756-ENET Ser B	v2.7
1756-L6x	v17.03
1756-6xS (Safety PLC)	v17.07
1768-ENBT	v2.003
1769-L32E	v17.04
1769-L35E	v17.04

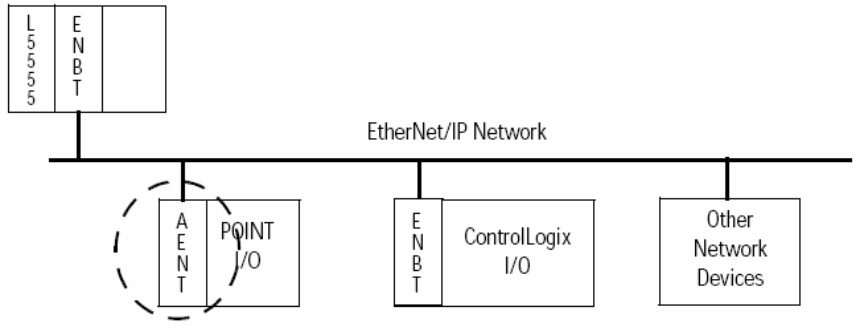
6.2 Functional Overview

6.2.1 About the Adapter

Important: You must use series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

The ILX34-AENWG adapter performs the following primary tasks:

- Control of real-time I/O data (also known as implicit messaging) - the ILX34-AENWG adapter serves as a bridge between POINT I/O modules and the network



- Support of messaging data for configuration and programming information (also known as explicit messaging)

6.2.2 Understand the Producer/Consumer Model

The CIP producer/consumer networking model replaces the old source/destination (master/slave) model. The producer/consumer model reduces network traffic and increases speed of transmission. In traditional I/O systems, controllers poll input modules to obtain their input status. In the CIP system, input modules are not polled by a controller. Instead, they produce (multicast) their data either upon a change of state (COS) or periodically.

The frequency of update depends upon the options chosen during configuration and where on the network the input module resides. The input module, therefore, is a producer of input data, and the controller is a consumer of the data.

The controller can also produce data for other controllers to consume. The produced and consumed data is accessible by multiple controllers and other devices over the EtherNet/IP network. This data exchange conforms to the producer/consumer model.

6.2.3 Use of the Common Industrial Protocol (CIP)

The ILX34-AENWG adapter uses the Common Industrial Protocol (CIP). CIP is the application layer protocol specified for EtherNet/IP, the Ethernet Industrial Protocol, as well as for ControlNet and DeviceNet networks. It is a message-based protocol that implements a relative path to send a message from the producing device in a system to the consuming devices.

- The producing device contains the path information that steers the message along the proper route to reach its consumers. Since the producing device holds this information, other devices along the path simply **pass** this information; they do not need to **store** it.

This has the following significant benefits.

- You do not need to configure routing tables in the bridging modules, which greatly simplifies maintenance and module replacement.
- You maintain full control over the route taken by each message, which enables you to select alternative paths for the same end device.

Understand Messaging

Class 3 (Explicit Message) requests through the ILX34-AENWG adapter to a specific POINT I/O module may not always receive a response from the I/O modules. In the case where the I/O module does not reply to the request, the adapter responds with an error code indicating a timeout.

6.2.4 Specify the Requested Packet Interval (RPI)

The RPI is the update rate specified for a particular piece of data on the network. The RPI can be specified for the adapter and include all of the I/O modules communicating through it (using a rack-optimized connection) or specified for a particular module (using direct connection).

When you add a module or an adapter to the I/O configuration of a controller, you must enter the RPI as a parameter. This value specifies how often to produce the data for that device. For example, if you specify an RPI of 50 ms, it means that every 50 ms the device should send its data to the controller or the controller should send its data to the device.

Use RPIs only for devices that exchange data. For example, a ControlLogix EtherNet/IP bridge module in the same chassis as the controller does not require an RPI, because it is not a data-producing member of the system. Its use is only as a bridge to remote racks.

6.3 ILX34-AENWG Wireless Diagnostic Object (101,0x65) Vendor Specific

One Instance of the Wireless Diagnostics Object will be available for the radio module. The following tables describe the instance definition in addition to the normal Class required definitions for this object.

6.3.1 Class Services Supported

Service Code No. (hex)	Service Name
0E	Get Attribute Single

6.3.2 Instance Services Supported

Service Code No. (hex)	Service Name
01	Get Attribute All
0E	Get Attribute single
10	Set Attribute Single
4C	Get and Clear Counters Get and Clear Counters applies to Attributes 7-10 only, if directed at attribute '100' for get and clear all attributes 7-10 values.
05	Reset

6.3.3 Attributes Supported: Wireless Diagnostics Vendor Specific

Inst ID	Attribute	Description	Get	Set	Size	Default Value / Description
0	1	Object Software Revision	X	-	Word	1
	2	Max Instance	X	-	Word	1
1	1	Radio Firmware Number	X	-	Long	Radio Module firmware revision. (Example: 6006 -> 6.60)
	2	Radio Link Time	X	X	Struct (Word - Days, Word - Hours, Word - Min's, Word - Sec's)	Radio Operational time. Resettable.
	3	Radio Parent MAC address	X	-	Array (6) of Byte	Connected Parent MAC address.
	4	Parent Data Rate	X	-	Word	Data rate of connection to parent. Data Rate TX Enumerated Rate Setting: 1, 2 ,5.5, 6, 11, 12, 18, 24, 36, 48, 54 (Mbps)
	5	Average Signal Level	X	-	Word	Signal strength in dBm of link to parent.
	6	Average Noise Level	X	-	Word	Noise Level in dBm.
	7	Packets Tx Success	X	X	Struct (Long, Long	Total Packet count and Avg/sec of successfully tramsitted packets. Resettable.
	8	Packets Tx Failures	X	X	Struct (Long, Long	Total Packet count and Avg/sec of failed tramsitted packets. Resettable
	9	Packets Tx Retries	X	X	Struct (Long, Long	Total Packet count and Avg/sec of retries of tramsitted packets. Resettable
	10	Packets Rx Success	X	X	Struct (Long, Long	Total Packet count and Avg/sec of successfully received packets. Resettable
	11	Radio Actual IP Address	X		Long	Radio IP Address Used
	12	Extended Radio FW Version	X		String	Extended Radio Firmware version in string format.
	100	Get and Clear Counters	X	X	All	Get and reset wireless diagnostic counters, only for Service code 0x4C.

6.4 ILX34-AENWG Wireless Configuration Object (102, 0x66) Vendor Specific

One Instance of the Wireless Configuration Object will be available for the radio module. The following tables describe the instance definition in addition to the normal Class required definitions for this object.

6.4.1 Instance Services Supported

Service Code No. (hex)	Service Name
01	Get Attribute All
0E	Get Attribute single
10	Set Attribute Single
4B	Apply Configuration This service code is allowed after all attributes have been updated to apply the configuration to the radio module and reset for settings to take effect.
05	Reset

6.4.2 Attributes Supported

Inst ID	Attribute	Description	Get	Set	Size	Default Value / Description
0	1	Object Software Revision	X	-	Word	1
	2	Max Instance	X	-	Word	Depends On Ports Supported
1	1	IP Address	X	X	Long	IP address of radio module. *Default: = AutoIP 0.0.6.0*
	2	Security Flags	X	X	Byte	Radio Module enables (see Configuration Parameters Description) *Default: 0x44,* *Resvr(b7 =0)* *SNMP(Disable b6=1), WebServ(Enable b5=0), Pt,77FEh(Enableb4 =0), Enh PW(Disable b3=0),* *Encrypt(Enable b2=1),* *TFTP(Enable b1=0),* *Telnet(Enable b0=0)*
	3	Range	X	-	Byte	Max supported Range in Kilometers. *Default: 20 kM*
	4	MAC Address	X	-	Array(6) of word	Radio assigned MAC address. *Default: Radio*
	5	802.11 Country Code	X	X	String (3)	802.11 Country Code: (3 bytes) Region of use IEC/ISO 3166-1 Alpha-2, encoding of the country code value for the following countries of use and environment per 802.11 standard (Refer to Configuration Parameter Table for description) *Default: 2 = JP, Inclusion of (0=US)*

Inst ID	Attribute	Description	Get	Set	Size	Default Value / Description
	6	Radio TX Power Level	X	X	Byte	User Configurable TX Power. (value in dbm) 0=0dBm 6=6dBm 12=12dBm 18=Max dBm *Default: 18*
	7	Transmission Data Rate	X	X	Byte	User Configurable Data Rate: 0= 1Mbps 1= 2Mbps 2= 5.5Mbps 3= 11Mbps 4= 18Mbps 5= 24Mbps 6= 36Mbps 7= 54Mbps 8= Auto: Max. 1Mbps 9= Auto: Max. 2Mbps 10= Auto: Max. 5.5Mbps 11= Auto: Max. 11Mbps 12= Auto: Max. 18Mbps 13= Auto: Max. 24Mbps 14= Auto: Max. 36Mbps 15= Auto: Max. 54Mbps *Default: 15 – Auto – Max. 54Mbps.*
	8	Power Management Enable	X	X	Byte	Power Management Enable/Disable: 0= Disable 1= Enable *Default: Disable = 0.*
	9	Wi-Fi Network Mode	X	X	Byte	Wi-Fi Network Mode : 0 = Infrastructure Mode 1 = AdHoc Mode *Default: Infrastructure*
	10	AdHoc Channel	X	X	Byte	AdHoc Channel Setting: Valid for: US; 1…11 FR; 10…13 JP; 1…14 Other; 1…13 SP; 10,11 CA; 1…11 *Default: US 1*

Inst ID	Attribute	Description	Get	Set	Size	Default Value / Description
	11	Encryption Setting	X	X	Byte	Encryption Settings: *Bit 0-1* Security: 0=None 1=WEP 2=WPA, 3=802.11i/WPA2. *Bit 2-4* Authentication method: 0=None 1=Shared/PSK 2-7= Reserved *Bit 5-7* Pairwise Encryption method: 0=None 1=WEP64 2=WEP128 3=TKIP 4=CCMP 5-7=Reserved *Default:* *0x67, AES->WPA2,Shared/PSK ,CCMP*
	12	WEP Key Length	X	X	Byte	Key Length: Key Length used in WEP encryption. *Default: 128*
	13	Key Type	X	X	Byte	Key Type: 0 = Hex, 1= Passphrase *Default: 1= passphrase*
	14	WEP Key Index	X	X	Byte	WEP key Index: Valid index 0-3 *Default: 1 (0)*
	15	SSID	X	X	String (32)	SSID Text String *Default:"Network1"*
	16	Passphrase	X	X	String (64)	Passphrase: Text String used to encode encryption key *Default:"passphrase"*
	17	Encryption Key 1	X	X	Array of 16 Bytes	Key #1 – 128 bit Hex Keys storage. Default: *00000000000000000000000000 (26 '0's)*
	18	Encryption Key 2	X	X	Array of 16 Bytes	Key #2 – 128 bit Hex Keys storage. Default: *00000000000000000000000000 (26 '0's)*
	19	Encryption Key 3	X	X	Array of 16 Bytes	Key #3 – 128 bit Hex Keys storage. Default: *00000000000000000000000000 (26 '0's)*
	20	Encryption Key 4	X	X	Array of 16 Bytes	Key #4 – 128 bit Hex Keys storage. *Default:* *00000000000000000000000000 (26 '0's)*

6.5 Antennas

When you are ready to connect antennas to the radio, see Connecting antennas.

You must also consider three important electrical characteristics when selecting antennas:

- Antenna pattern (page 187)
- Antenna gain (page 188)
- Antenna polarity (page 188)
- Antenna location, spacing, and mounting (page 192)

6.5.1 Antenna Pattern

Information between two wireless devices is transferred via electromagnetic energy radiated by one antenna and received by another. The radiated power of most antennas is not uniform in all directions and has varying intensities. The radiated power in various directions is called the pattern of the antenna. Each antenna should be mounted so that its direction of strongest radiation intensity points toward the other antenna or antennas with which it will exchange signals.

Complete antenna patterns are three-dimensional, although often only a two-dimensional slice of the pattern is shown when all the antennas of interest are located in roughly the same horizontal plane, along the ground rather than above or below one another.

A slice taken in a horizontal plane through the center (or looking down on the pattern) is called the azimuth pattern. A view from the side reveals a vertical plane slice called the elevation pattern.

An antenna pattern with equal or nearly equal intensity in all directions is omnidirectional. In two dimensions, an omnidirectional pattern appears as a circle (in three dimensions, an omnidirectional antenna pattern would be a sphere, but no antenna has true omnidirectional pattern in three dimensions). An antenna is considered omnidirectional if one of its two dimensional patterns, either azimuth or elevation pattern, is omnidirectional.

Beamwidth is an angular measurement of how strongly the power is concentrated in a particular direction. Beamwidth is a three dimensional quantity but can be broken into two-dimensional slices just like the antenna pattern. The beamwidth of an omnidirectional pattern is 360 degrees because the power is equal in all directions.

6.5.2 Antenna Gain

Antenna gain is a measure of how strongly an antenna radiates in its direction of maximum radiation intensity compared to how strong the radiation would be if the same power were applied to an antenna that radiated all of its power equally in all directions. Using the antenna pattern, the gain is the distance to the furthest point on the pattern from the origin. For an omnidirectional pattern, the gain is 1, or equivalently 0 dB. The higher the antenna gain is, the narrower the beamwidth, and vice versa.

The amount of power received by the receiving antenna is proportional to the transmitter power multiplied by the transmit antenna gain, multiplied by the receiving antenna gain. Therefore, the antenna gains and transmitting power can be traded off. For example, doubling one antenna gain has the same effect as doubling the transmitting power. Doubling both antenna gains has the same effect as quadrupling the transmitting power.

6.5.3 Antenna Polarity

Antenna polarization refers to the direction in which the electromagnetic field lines point as energy radiates away from the antenna. In general, the polarization is elliptical. The simplest and most common form of this elliptical polarization is a straight line, or linear polarization. Of the transmitted power that reaches the receiving antenna, only the portion that has the same polarization as the receiving antenna polarization is actually received. For example, if the transmitting antenna polarization is pointed in the vertical direction (vertical polarization, for short), and the receiving antenna also has vertical polarization, the maximum amount of power possible will be received. On the other hand, if the transmit antenna has vertical polarization and the receiving antenna has horizontal polarization, no power should be received. If the two antennas have linear polarizations oriented at 45° to each other, half of the possible maximum power will be received.

6.5.4 Whip antennas

You can use a 1/2 wave straight whip or 1/2 wave articulating whip (2 dBi) antenna with ILX34-AENWG radios. These antennas are the most common type in use today. Such antennas are approximately 5 inches long, and are likely to be connected to a client radio (connected directly to the radio enclosure). These antennas do not require a ground plane. Articulating antennas and non-articulating antennas work in the same way. An articulating antenna bends at the connection.

6.5.5 Collinear array antennas

A collinear array antenna is typically composed of several linear antennas stacked on top of each other. The more stacked elements it has, the longer it is, and the more gain it has. It is fed in on one end.

The antenna pattern is torroidal. Its azimuthal beamwidth is 360° (omnidirectional). Its vertical beamwidth depends on the number of elements/length, where more elements equal narrower beamwidth. The antenna gain also depends on the number of elements/length, where more elements produce higher gain. Typical gain is 5 to 10 dBi.

The antenna polarity is linear, or parallel to the length of the antenna.

6.5.6 Yagi Array Antenna

A yagi antenna is composed of an array of linear elements, each parallel to one another and attached perpendicular to and along the length of a metal boom. The feed is attached to only one of the elements. Elements on one side of the fed element are longer and act as reflectors; elements on the other side are shorter and act as directors. This causes the antenna to radiate in a beam out of the end with the shorter elements. The pattern depends on the overall geometry, including the number of elements, element spacing, element length, and so on. Sometimes the antenna is enclosed in a protective tube hiding the actual antenna geometry.

The antenna pattern (page 187) is a beam pointed along the boom toward the end with the shorter elements. The beamwidth varies with antenna geometry but generally is proportional to the length (where longer length produces a narrower beam).

The antenna gain (page 188) varies with antenna geometry but generally is proportional to the length (where longer length produces higher gain). Typical values are 6 to 15dBi.

The antenna polarity is Linear (parallel to the elements, perpendicular to the boom).

Refer to the Antenna Types overview section for other types of approved antennas.

6.5.7 Parabolic reflector antennas

A parabolic reflector antenna consists of a parabolic shaped dish and a feed antenna located in front of the dish. Power is radiated from the feed antenna toward the reflector. Due to the parabolic shape, the reflector concentrates the radiation into a narrow pattern, resulting in a high- gain beam.

The antenna pattern is a beam pointed away from the concave side of the dish. Beamwidth and antenna gain vary with the size of the reflector and the antenna construction. Typical gain values are 15 to 30 dBi.

The antenna polarity depends on the feed antenna polarization.

6.5.8 Adding bi-directional amplifiers

A bi-directional amplifier may be needed if an application requires long lengths of coaxial cable to reach the antenna. The amplifier is designed to put maximum transmit power right at the antenna and boost the received signal primarily to overcome the cable loss. You can only use an amplifier from ProSoft Technology that is specifically approved for use with the ILX34-AENWG radio, and only in countries where the amplifier option is approved.

The bi-directional amplifier is designed to operate with a coaxial cable loss between the radio and amplifier of 6.5 dB to 20 dB. The output is always 1/2W, regardless of the input level. With less than 6.5-dB loss, the amplifier maximum input rating will be exceeded. With more than 20-dB cable loss, the amplifier will not turn on.

Refer to Amplifier chart (page 190) to view the minimum and maximum lengths of various cable types required when you use a bi-directional amp.

Refer to Amplifier Diagram (page 191) for an installation diagram of the amplifier and its power supply.

Amplifier chart

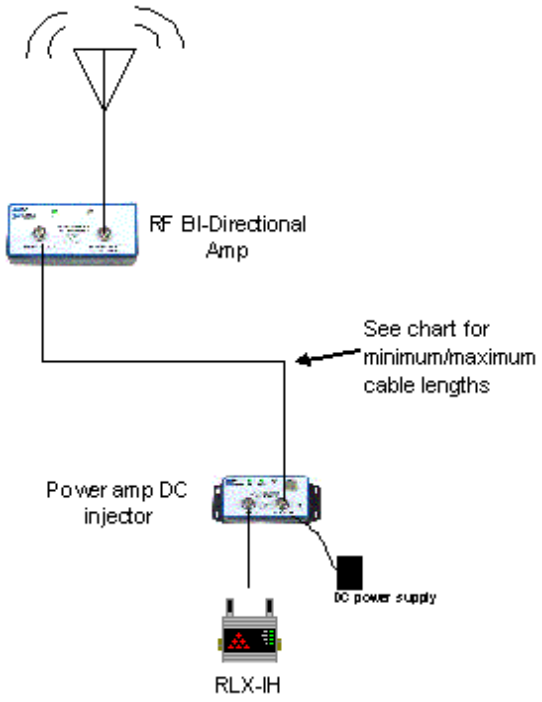
The following chart lists the minimum and maximum lengths of various cable types required when you use a bi-directional amplifier.

Cable Type	Cable loss/ 100' (dB)	Minimum length (feet)	Loss (dB)	Maximum length (feet)	Loss (dB)
LMR195	18.2	36	6.5	109	20
LMR400	6.9	94	6.5	289	20
LMR600	4.4	148	6.5	454	20
LDF4-50A	3.9	167	6.5	512	20
LDF5-50A	2	325	6.5	1000	20

Amplifier diagram

The following illustration shows proper installation of the amplifier and its power supply. The DC injector can be located by the radio, and the amplifier should be at the antenna. The bi-directional amplifier is weather proof and can be mounted outdoors. Refer to the bi-directional amplifier instructions for more information.

Refer to the amplifier chart (page 190) for minimum and maximum cable lengths.



6.5.9 Antenna location, spacing, and mounting

Consider the following points regarding antenna location, spacing, and mounting:

- When placing antennas, ensure a clear line of sight between the master radio's antenna and all of the other radio antennas.
- If the site base contains obstructing terrain or structures, mount the antenna on a tower or rooftop to provide a line-of-sight path. The line-of-sight consideration becomes more important as the transmission path becomes longer.
- Mount the antennas as high off the ground as is practical. The higher an antenna is above the ground, the greater its range.
- Mount the antennas away from massive structures. Radio signals bounce off metal walls, for example, which can compromise a clear signal.
- Mount antennas to minimize the amount of nearby metal structures in the antenna pattern.
- Mount the antennas and install radios away from sources of RF interference.
- Use the shortest possible antenna cable length. Signals lose power over the cable's distance.
- Choose antennas that are appropriate for the network's intended function.
- If antennas are on radios on the same network, mount them so they have the same polarity. If the antennas are on separate networks, mount them so they have a different antenna polarity—for example, mount one antenna vertically and the other horizontally.
- Space radios at least three feet (one meter) apart so they do not overload each other. If antennas must be near each other:
    - Mount omnidirectional antennas directly above each other.
    - Position directional antennas so they do not point at nearby antennas. Place antennas side by side if they point in the same direction. Place antennas back to back if they point in opposite directions.

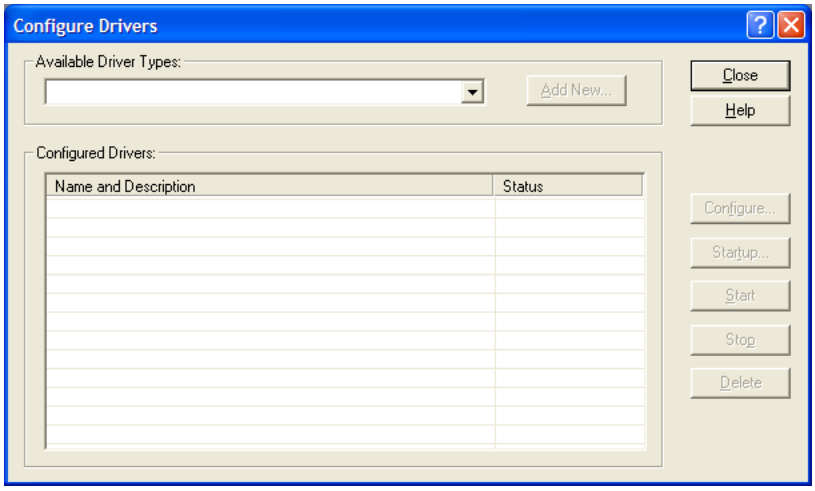
6.6 Configuring RSLinx

To communicate with your ILX34-AENWG adapter over your network, you must configure the RSLinx Ethernet communication driver (AB_ETH) or the EtherNet/IP driver (AB-ETHIP). You can configure the AB_ETH driver with the IP addresses of all the Ethernet devices on your system. You need one of these drivers to download the example application programs in this manual.

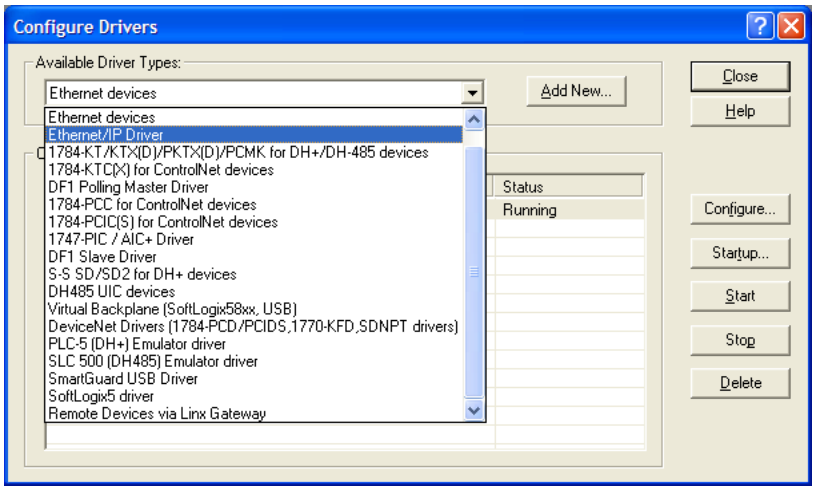
Note: If you have not already done so, please install RSLinx from your Rockwell Software CD-ROM.
Attention: You must use Series C POINT I/O modules with the ILX34-AENWG adapter. Series A or B POINT I/O modules will not work with this adapter.

6.6.1 Configure the AB_ETH/IP Driver

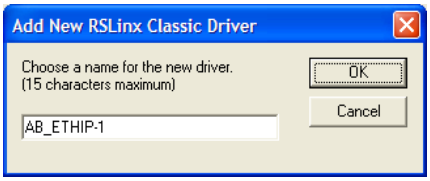
1. Start RSLinx software.
2. Open the **COMMUNICATIONS** menu, and then select **CONFIGURE DRIVERS**. This action opens the **CONFIGURE DRIVERS** dialog box.



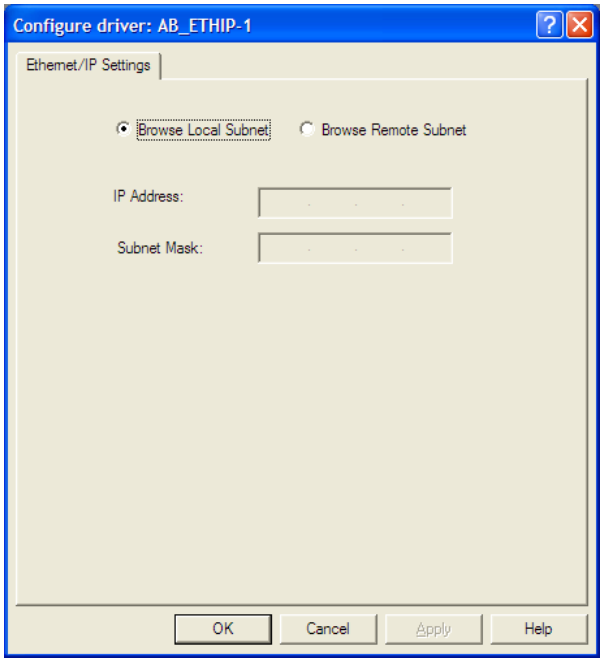
3 Click the arrow to the right of the Available Driver Types field, and then select **ETHERNET/IP DRIVER** from the dropdown list.



4 Click the **ADD/NEW** button, and then click **OK** in the **ADD NEW RSLINX DRIVER** dialog box.

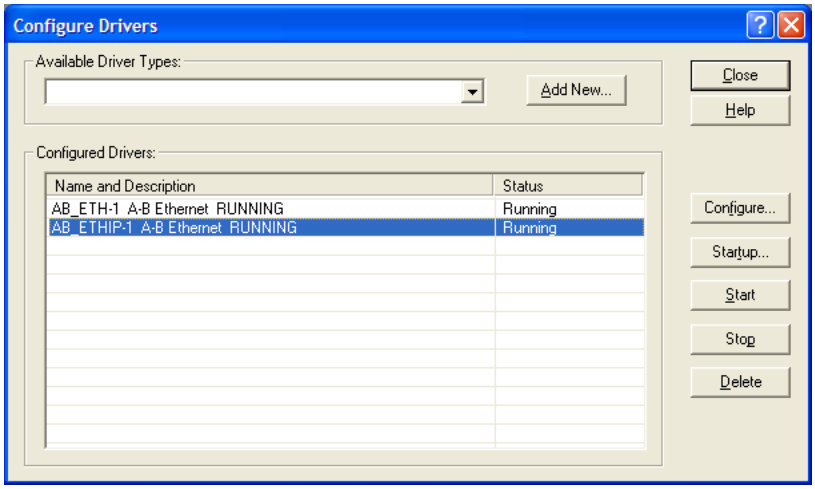


5 In the **CONFIGURE DRIVER** dialog box, make sure the Browse Local Subnet item is selected.



6 Make sure the **BROWSE LOCAL SUBNET** item is selected. RSLinx software will browse your local subnet and retrieve the IP address.

7 Click **OK** to save your settings and dismiss the **CONFIGURE DRIVER** dialog box. The new driver will appear in the list of configured drivers.



8 Close RSLinx software.

6.7 Using the ILX34-AENWG with Earlier Versions of RSLogix 5000

You can use the ILX34-AENWG module with earlier versions (16 and lower) of RSLogix 5000, however earlier versions of RSLogix 5000 do not support the Add-On Profile that provides configuration and statistics tabs for the wireless portion of the ILX34-AENWG.

- Add the ILX34-AENWG adapter as a Rockwell Automation 1734-AENT
- Make sure to disable keying in the 1734-AENT profile.
- The only configuration interface for the wireless portion of the adapter is through the configuration web page (page 34). You must connect to the ILX34-AENWG with an Ethernet cable to configure the wireless settings for the first time. After the wireless portion of the adapter is configured, you can reconfigure the adapter over-the-air.

6.8 Additional Point I/O Documentation

The following related publications are available from Rockwell Automation's web site at literature.rockwellautomation.com.

Topic	Document Title	Publication Number
Using EtherNet/IP for industrial control	EtherNet/IP Performance and Application Guide	ENET-AP001
EtherNet/IP media	EtherNet/IP Media Planning and Installation Guide	ENET-IN001
Ethernet communication interface modules	Ethernet Communication Interface Module Installation Instructions	1756-IN053

Topic	Document Title	Publication Number
	Ethernet Communication Interface Module User Manual	1756-UM051
	Ethernet Communication Interface Module Release Notes	1756-RN053
ControlLogix chassis	ControlLogix Chassis Installation Instructions	1756-IN080 (series B)
ControlLogix power supplies	ControlLogix Power Supplies Installation Instructions	1756-5.67 (PA72/PB72)
Logix5555 programmable controllers	Logix5555 Controller User Manual	1756-UM523
SoftLogix5800 Controller	SoftLogix5800 User Manual	1789-UM002 (L10, L30, L60)
ControlLogix EtherNet/IP bridge module with firmware revision 2.3 or later	ControlLogix EtherNet/IP Bridge Module Installation Instructions	1756-IN019
RSLogix 5000 programming software	Getting Results with RSLogix 5000, version 3.2.1 or later	9399-RLD300GR
1734-AENT adapter	POINT I/O EtherNet/IP Adapter Installation Instructions	1734-IN590
POINT I/O digital and analog modules and PointBLOCK I/O modules	POINT I/O Digital and Analog Modules and PointBLOCK I/O Modules User Manual	1734-UM001
POINT I/O interface modules	POINT I/O RS-232 ASCII Module User Manual	1734-UM009
	POINT I/O RS-232 ASCII Module Installation Instructions	1734-IN588
POINT I/O expansion power supply	POINT I/O 24V dc Expansion Power Supply Installation Instructions	1734-IN058
POINT I/O field potential distributor	POINT I/O Field Potential Distributor Installation Instructions	1734-IN059
POINT I/O input modules	POINT I/O 120V ac Input Module Installation Instructions	1734-IN010
	POINT I/O Input Module Installation Instructions	1734-IN051
POINT I/O encoders/counter modules	POINT I/O Encoders/Counter Module User Manual	1734-UM006
	POINT I/O Encoders/Counter Module Installation Instructions	1734-IN005
POINT I/O 22V ac input module	POINT I/O 220V ac Input Module Installation Instructions	1734-IN008
POINT I/O RTD and isolated thermocouple input module	POINT I/O RTD and Isolated Thermocouple Input Module Installation Instructions	1734-IN011
POINT I/O thermocouple and RTD input module	Thermocouple and RTD Input Module User Manual	1734-UM004
POINT I/O IV2 and IV4 input module	POINT I/O Input Module Installation Instructions	1734-IN052
POINT I/O 120/220V ac Output module	POINT I/O 120/220V ac Output Module Installation Instructions	1734-IN009

Topic	Document Title	Publication Number
POINT I/O protected output module	POINT I/O Protected Output Module Installation Instructions	1734-IN056
	POINT I/O Protected Output Module Installation Instructions (OB2EP)	1734-IN586
POINT I/O voltage output analog module	POINT I/O 2 Voltage Output Analog Module Installation Instructions	1734-IN002
POINT I/O protected sink output module	POINT I/O Protected Sink Output Module Installation Instructions	1734-IN585
POINT I/O 2 relay output module	POINT I/O 2 Relay Output Module Installation Instructions (OX2)	1734-IN587
	POINT I/O 2 Relay Output Module Installation Instructions (OW2)	1734-IN055
POINT I/O synchronous serial interface absolute encoder module	POINT I/O Synchronous Serial Interface Absolute Encoder Module Installation Instructions	1734-UM007
POINT I/O cold junction compensation wiring base assembly	POINT I/O Cold Junction Compensation Wiring Base Assembly Installation Instructions	1734-IN583
POINT I/O wiring base assembly	POINT I/O Wiring Base Assembly Installation Instructions	1734-IN013
Very high speed-counter module	POINT I/O Very High-speed Counter Module Installation Instructions	1734-IN003
	Very High-speed Counter Module User Manual	1734-UM003
RSLinx	RSLinx Getting Results Guide	LNXENT-GR001
1734-AENT Point I/O EtherNet/IP Adapter	POINT I/O EtherNet/IP User Manual	1734-UM011
	POINT I/O EtherNet/IP Adapter Release Notes	1734-RN002

7 Support, Service & Warranty

In This Chapter

- Contacting Technical Support 199
- Return Material Authorization (RMA) Policies and Conditions 201
- LIMITED WARRANTY..... 203

Contacting Technical Support

ProSoft Technology, Inc. (ProSoft) is committed to providing the most efficient and effective support possible. Before calling, please gather the following information to assist in expediting this process:

1. Product Version Number
2. System architecture
3. Network details

If the issue is hardware related, we will also need information regarding:

1. Module configuration and associated ladder files, if any
2. Module operation and any unusual behavior
3. Configuration/Debug status information
4. LED patterns
5. Details about the serial, Ethernet or fieldbus devices interfaced to the module, if any.

Note: *For technical support calls within the United States, an after-hours answering system allows 24-hour/7-days-a-week pager access to one of our qualified Technical and/or Application Support Engineers. Detailed contact information for all our worldwide locations is available on the following page.*

Internet	Web Site: www.prosoft-technology.com/support E-mail address: support@prosoft-technology.com
Asia Pacific (location in Malaysia)	Tel: +603.7724.2080, E-mail: asiapc@prosoft-technology.com Languages spoken include: Chinese, English
Asia Pacific (location in China)	Tel: +86.21.5187.7337 x888, E-mail: asiapc@prosoft-technology.com Languages spoken include: Chinese, English
Europe (location in Toulouse, France)	Tel: +33 (0) 5.34.36.87.20, E-mail: support.EMEA@prosoft-technology.com Languages spoken include: French, English
Europe (location in Dubai, UAE)	Tel: +971-4-214-6911, E-mail: mea@prosoft-technology.com Languages spoken include: English, Hindi
North America (location in California)	Tel: +1.661.716.5100, E-mail: support@prosoft-technology.com Languages spoken include: English, Spanish
Latin America (Oficina Regional)	Tel: +1-281-2989109, E-Mail: latinam@prosoft-technology.com Languages spoken include: Spanish, English
Latin America (location in Puebla, Mexico)	Tel: +52-222-3-99-6565, E-mail: soporte@prosoft-technology.com Languages spoken include: Spanish
Brasil (location in Sao Paulo)	Tel: +55-11-5083-3776, E-mail: brasil@prosoft-technology.com Languages spoken include: Portuguese, English

7.1 Return Material Authorization (RMA) Policies and Conditions

The following Return Material Authorization (RMA) Policies and Conditions (collectively, "RMA Policies") apply to any returned product. These RMA Policies are subject to change by ProSoft Technology, Inc., without notice. For warranty information, see Limited Warranty (page 203). In the event of any inconsistency between the RMA Policies and the Warranty, the Warranty shall govern.

7.1.1 Returning Any Product

a) In order to return a Product for repair, exchange, or otherwise, the Customer must obtain a Return Material Authorization (RMA) number from ProSoft Technology and comply with ProSoft Technology shipping instructions.
b) In the event that the Customer experiences a problem with the Product for any reason, Customer should contact ProSoft Technical Support at one of the telephone numbers listed above (page 199). A Technical Support Engineer will request that you perform several tests in an attempt to isolate the problem. If after completing these tests, the Product is found to be the source of the problem, we will issue an RMA.
c) All returned Products must be shipped freight prepaid, in the original shipping container or equivalent, to the location specified by ProSoft Technology, and be accompanied by proof of purchase and receipt date. The RMA number is to be prominently marked on the outside of the shipping box. Customer agrees to insure the Product or assume the risk of loss or damage in transit. Products shipped to ProSoft Technology using a shipment method other than that specified by ProSoft Technology, or shipped without an RMA number will be returned to the Customer, freight collect. Contact ProSoft Technical Support for further information.
d) A 10% restocking fee applies to all warranty credit returns, whereby a Customer has an application change, ordered too many, does not need, etc. Returns for credit require that all accessory parts included in the original box (i.e.; antennas, cables) be returned. Failure to return these items will result in a deduction from the total credit due for each missing item.

7.1.2 Returning Units Under Warranty

A Technical Support Engineer must approve the return of Product under ProSoft Technology's Warranty:

a) A replacement module will be shipped and invoiced. A purchase order will be required.
b) Credit for a product under warranty will be issued upon receipt of authorized product by ProSoft Technology at designated location referenced on the Return Material Authorization
    i. If a defect is found and is determined to be customer generated, or if the defect is otherwise not covered by ProSoft Technology s warranty, there will be no credit given. Customer will be contacted and can request module be returned at their expense;
    ii. If defect is customer generated and is repairable, customer can authorize ProSoft Technology to repair the unit by providing a purchase order for 30% of the current list price plus freight charges, duties and taxes as applicable.

7.1.3 Returning Units Out of Warranty

a) Customer sends unit in for evaluation to location specified by ProSoft Technology, freight prepaid.
b) If no defect is found, Customer will be charged the equivalent of $100 USD, plus freight charges, duties and taxes as applicable. A new purchase order will be required.
c) If unit is repaired, charge to Customer will be 30% of current list price (USD) plus freight charges, duties and taxes as applicable. A new purchase order will be required or authorization to use the purchase order submitted for evaluation fee.

The following is a list of non-repairable units:

ScanPort Adapters

- 1500 - All
- 1550 - Can be repaired only if defect is the power supply
- 1560 - Can be repaired only if defect is the power supply

inRAx Modules

- 3150 - All
- 3170 - All
- 3250
- 3300
- 3350
- 3600 - All
- 3700
- 3750
- 3800-MNET

ProLinx Standalone Gateways

- 4xxx - All (No hardware available to do repairs)

7.2 LIMITED WARRANTY

This Limited Warranty ("Warranty") governs all sales of hardware, software, and other products (collectively, "Product") manufactured and/or offered for sale by ProSoft Technology, Incorporated (ProSoft), and all related services provided by ProSoft, including maintenance, repair, warranty exchange, and service programs (collectively, "Services"). By purchasing or using the Product or Services, the individual or entity purchasing or using the Product or Services ("Customer") agrees to all of the terms and provisions (collectively, the "Terms") of this Limited Warranty. All sales of software or other intellectual property are, in addition, subject to any license agreement accompanying such software or other intellectual property.

7.2.1 What Is Covered By This Warranty

a) *Warranty On New Products*: ProSoft warrants, to the original purchaser, that the Product that is the subject of the sale will (1) conform to and perform in accordance with published specifications prepared, approved and issued by ProSoft, and (2) will be free from defects in material or workmanship; provided these warranties only cover Product that is sold as new. This Warranty expires three (3) years from the date of shipment for Product purchased **on or after** January 1st, 2008, or one (1) year from the date of shipment for Product purchased **before** January 1st, 2008 (the "Warranty Period"). If the Customer discovers within the Warranty Period a failure of the Product to conform to specifications, or a defect in material or workmanship of the Product, the Customer must promptly notify ProSoft by fax, email or telephone. In no event may that notification be received by ProSoft later than 39 months from date of original shipment. Within a reasonable time after notification, ProSoft will correct any failure of the Product to conform to specifications or any defect in material or workmanship of the Product, with either new or remanufactured replacement parts. ProSoft reserves the right, and at its sole discretion, may replace unrepairable units with new or remanufactured equipment. All replacement units will be covered under warranty for the 3 year period commencing from the date of original equipment purchase, not the date of shipment of the replacement unit. Such repair, including both parts and labor, will be performed at ProSoft's expense. All warranty service will be performed at service centers designated by ProSoft.

b) *Warranty On Services*: Materials and labor performed by ProSoft to repair a verified malfunction or defect are warranteed in the terms specified above for new Product, provided said warranty will be for the period remaining on the original new equipment warranty or, if the original warranty is no longer in effect, for a period of 90 days from the date of repair.

7.2.2 What Is Not Covered By This Warranty

a) ProSoft makes no representation or warranty, expressed or implied, that the operation of software purchased from ProSoft will be uninterrupted or error free or that the functions contained in the software will meet or satisfy the purchaser's intended use or requirements; the Customer assumes complete responsibility for decisions made or actions taken based on information obtained using ProSoft software.

b) This Warranty does not cover the failure of the Product to perform specified functions, or any other non-conformance, defects, losses or damages caused by or attributable to any of the following: (i) shipping; (ii) improper installation or other failure of Customer to adhere to ProSoft's specifications or instructions; (iii) unauthorized repair or maintenance; (iv) attachments, equipment, options, parts, software, or user-created programming (including, but not limited to, programs developed with any IEC 61131-3, "C" or any variant of "C" programming languages) not furnished by ProSoft; (v) use of the Product for purposes other than those for which it was designed; (vi) any other abuse, misapplication, neglect or misuse by the Customer; (vii) accident, improper testing or causes external to the Product such as, but not limited to, exposure to extremes of temperature or humidity, power failure or power surges; or (viii) disasters such as fire, flood, earthquake, wind and lightning.

c) The information in this Agreement is subject to change without notice. ProSoft shall not be liable for technical or editorial errors or omissions made herein; nor for incidental or consequential damages resulting from the furnishing, performance or use of this material. The user guide included with your original product purchase from ProSoft contains information protected by copyright. No part of the guide may be duplicated or reproduced in any form without prior written consent from ProSoft.

7.2.3 Disclaimer Regarding High Risk Activities

Product manufactured or supplied by ProSoft is not fault tolerant and is not designed, manufactured or intended for use in hazardous environments requiring fail-safe performance including and without limitation: the operation of nuclear facilities, aircraft navigation of communication systems, air traffic control, direct life support machines or weapons systems in which the failure of the product could lead directly or indirectly to death, personal injury or severe physical or environmental damage (collectively, "high risk activities"). ProSoft specifically disclaims any express or implied warranty of fitness for high risk activities.

7.2.4 Intellectual Property Indemnity

Buyer shall indemnify and hold harmless ProSoft and its employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not ProSoft is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless ProSoft and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party. ProSoft makes no warranty that the product is or will be delivered free of any person's claiming of patent, trademark, or similar infringement. The Buyer assumes all risks (including the risk of suit) that the product or any use of the product will infringe existing or subsequently issued patents, trademarks, or copyrights.

a) Any documentation included with Product purchased from ProSoft is protected by copyright and may not be duplicated or reproduced in any form without prior written consent from ProSoft.
b) ProSoft's technical specifications and documentation that are included with the Product are subject to editing and modification without notice.
c) Transfer of title shall not operate to convey to Customer any right to make, or have made, any Product supplied by ProSoft.
d) Customer is granted no right or license to use any software or other intellectual property in any manner or for any purpose not expressly permitted by any license agreement accompanying such software or other intellectual property.
e) Customer agrees that it shall not, and shall not authorize others to, copy software provided by ProSoft (except as expressly permitted in any license agreement accompanying such software); transfer software to a third party separately from the Product; modify, alter, translate, decode, decompile, disassemble, reverse-engineer or otherwise attempt to derive the source code of the software or create derivative works based on the software; export the software or underlying technology in contravention of applicable US and international export laws and regulations; or use the software other than as authorized in connection with use of Product.

f) **Additional Restrictions Relating To Software And Other Intellectual Property**

In addition to compliance with the Terms of this Warranty, Customers purchasing software or other intellectual property shall comply with any license agreement accompanying such software or other intellectual property. Failure to do so may void this Warranty with respect to such software and/or other intellectual property.

7.2.5 Disclaimer of all Other Warranties

The Warranty set forth in What Is Covered By This Warranty (page 203) are in lieu of all other warranties, express or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

7.2.6 Limitation of Remedies **

In no event will ProSoft or its Dealer be liable for any special, incidental or consequential damages based on breach of warranty, breach of contract, negligence, strict tort or any other legal theory. Damages that ProSoft or its Dealer will not be responsible for include, but are not limited to: Loss of profits; loss of savings or revenue; loss of use of the product or any associated equipment; loss of data; cost of capital; cost of any substitute equipment, facilities, or services; downtime; the claims of third parties including, customers of the Purchaser; and, injury to property.

** Some areas do not allow time limitations on an implied warranty, or allow the exclusion or limitation of incidental or consequential damages. In such areas, the above limitations may not apply. This Warranty gives you specific legal rights, and you may also have other rights which vary from place to place.

7.2.7 Time Limit for Bringing Suit

Any action for breach of warranty must be commenced within 39 months following shipment of the Product.

7.2.8 No Other Warranties

Unless modified in writing and signed by both parties, this Warranty is understood to be the complete and exclusive agreement between the parties, suspending all oral or written prior agreements and all other communications between the parties relating to the subject matter of this Warranty, including statements made by salesperson. No employee of ProSoft or any other party is authorized to make any warranty in addition to those made in this Warranty. The Customer is warned, therefore, to check this Warranty carefully to see that it correctly reflects those terms that are important to the Customer.

7.2.9 Allocation of Risks

This Warranty allocates the risk of product failure between ProSoft and the Customer. This allocation is recognized by both parties and is reflected in the price of the goods. The Customer acknowledges that it has read this Warranty, understands it, and is bound by its Terms.

7.2.10 Controlling Law and Severability

This Warranty shall be governed by and construed in accordance with the laws of the United States and the domestic laws of the State of California, without reference to its conflicts of law provisions. If for any reason a court of competent jurisdiction finds any provisions of this Warranty, or a portion thereof, to be unenforceable, that provision shall be enforced to the maximum extent permissible and the remainder of this Warranty shall remain in full force and effect. Any cause of action with respect to the Product or Services must be instituted in a court of competent jurisdiction in the State of California.

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